

ENHANCING PRODUCTIVE PHYSICAL THERAPY IN CHILDREN
USING STRATEGIC INTERACTION TRAINING

BY

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Many children with developmental disabilities or orthopedic impairments require physical therapy (PT) to help maximize function, independence, and mobility. Children with developmental disabilities may also have impaired cognitive abilities and a higher incidence of negative behavior that can interfere with PT. Negative behaviors such as noncompliance, resistance, tantrums, and other delay tactics can often prevent the therapist from implementing a treatment program and thus impede the process of PT. Yet without PT, these children are at increased risk for progression of their disabilities and immobility as well as further impairment of their social development.

The present study used a training intervention to teach physical therapists behavioral techniques to deal more effectively with children who exhibit behavior problems in PT. A multiple baseline design was used with two therapists and four children in an inpatient children's hospital, and two therapists and three children in an outpatient setting. Results indicated that physical therapists learned the behavior modification techniques and incorporated these skills into their daily PT session. Results also indicated that therapists

increased their levels of direct commands, praise, attention to appropriate child behavior, and ignoring inappropriate child behavior. Further, child compliance rates increased, and inappropriate child behaviors decreased. The intervention was rated positively by all therapists.

INTRODUCTION AND REVIEW OF THE LITERATURE

Many children with developmental disabilities or orthopedic impairments require physical therapy (PT). Goals of PT may be to increase or maintain strength or range of motion, prevent contractures or other deformities, provide appropriate seating to maximize function and promote postural alignment, and improve functional mobility and independence. However, many of these children may not receive adequate PT due to refusal by private insurance or managed care companies to pay for PT or to authorize adequate numbers of sessions. Other children may not receive adequate services due to time constraints on the therapist to provide more than standard range of motion exercises. Still other children may not receive the PT they need due to behavior problems that interfere with the therapy and limit progress towards therapeutic goals.

Compared with typically developing children, children with developmental disabilities often have impaired cognitive abilities, attention deficits, a higher need for attention from adults, and a high incidence of negative behavior (Briener & Beck, 1984). Conduct problems such as noncompliance, aggression, resistance, crying, tantrums, withdrawing, and other delay tactics can often prevent the therapist from implementing a treatment program and thus impede the process of PT. Studies using functional analyses to identify influences on problem behaviors found that behavior problems occur more frequently in high demand situations (Repp & Karsh, 1994; Carr, Newsom, & Binkoff, 1980). Carr and Durand (1985) found that inappropriate behaviors increased during high demand situations and in the absence of adult attention. Physical therapy is a high demand

situation requiring the patient to perform multiple exercises and activities that are often difficult and may be painful. Thus, the pediatric physical therapist is frequently faced with children who are aggressive and noncompliant often without the skills to handle such behavior. Yet without PT, these children are likely to be at increased risk for progression of their disabilities and immobility as well as further impairment of their social development.

There is a plethora of literature focusing on interventions for aberrant behaviors in persons with developmental disabilities (Repp & Karsh, 1994). Such research has typically been conducted by psychologists and has been conducted in a variety of settings such as schools (e.g., Repp & Karsh 1994), the dental office (Allen & Stokes, 1987), the home (Day, Horner, & O'Neill, 1994), inpatient settings (Mace, Page, Ivancic, & O'Brien, 1986), and during PT sessions (Rapport & Bailey, 1985).

According to the literature (Carr, 1977; Durand & Carr, 1985), four primary motivating conditions for engaging in aberrant behaviors such as self-injurious and aggressive behavior have been identified. These include attention seeking behaviors, escape motivated behavior, sensory motivated behaviors (e.g. self-injurious behavior; SIB), and obtaining tangible consequences such as food or a toy. Escape and attention have been found to be the most common motivating conditions (Iwata et al., 1994).

The appearance of aggression and noncompliant behavior in PT is not uncommon. Reynell (1965) found an interfering, negative behavioral response pattern in postoperative children with cerebral palsy. One of the more notable behaviors reported during treatment observations, described by both the therapists and the children's parents, was aggression toward the therapist. Lalli, Mauk, Goh, and Merlino (1994) and Manella and Varni (1981) noted that problem behaviors such as aggression and self-injurious behavior increased when the patients were requested to participate in their PT sessions. Horner (1971) reported the

occurrence of aggression in a 5 year old child with spina bifida and mental retardation as the requirements for walking were increased. Carr, Newsom, and Binkoff (1980) found that aggression in children with retardation increased in demand situations. Furthermore, it was shown that aggression was maintained by negative reinforcement in the form of escape from demands. The general conclusion has been that aggression often functions as an escape response in such high demand situations and when successful, is maintained through negative reinforcement. Depending on the physical therapist's response to such behaviors, the child may adapt and progress physically or the child may regress in his/her behavioral, emotional or physical repertoire (Stokes, Mowrey, Dean, & Hoffman, 1997).

Not only might physical therapists have to overcome overt behaviors such as aggression, tantrum behavior, resistance, and pain behaviors, but they might also deal with other delay tactics that impede the flow of therapy. Such problems may include inattention, self-stimulating behaviors, noncompliance, and dawdling such as stopping an exercise to ask questions or to engage the therapist or others in conversation. These behaviors are equally interfering with the process of PT and increase the amount of time spent in therapy while decreasing productivity.

Behavior therapy has been shown to be an effective approach to evaluating and changing behavior. Behavior modification techniques have long been used with children and adults with cerebral palsy, mental retardation, autism, and other developmental disabilities to treat behaviors such as self-injurious behavior (Durand & Carr, 1985), aggression (Carr, Newsom, & Binkoff, 1980), noncompliance (Rapport & Bailey, 1985), pain behaviors (Fordyce, Shelton, & Dundore, 1982), and others. However, the use of behavior modification techniques in PT by physical therapists has been slow to evolve.

The use of behavior modification in PT can serve to modify the environment to reduce difficult behaviors that interrupt therapy. Yet, the majority of applications of behavior modification in the PT setting reported in the literature have focused on using behavior modification to increase motor skills (Martin, 1976). Additionally, such interventions appear to have been conducted by psychologists and not the physical therapists. However, the majority of children with physical disabilities are treated by physical therapists, not behavior therapists. Few attempts have been made to train physical therapists in behavioral techniques to modify children's behavior.

Lalli, Mauk, Goh, and Merlino (1994) successfully trained two physical therapists to use a behavioral intervention to increase compliance to commands, decrease rates of problem behaviors, and increase the distance ambulated in PT. The training of the physical therapists occurred after the behavior therapist had implemented the intervention and had determined its effectiveness. Unfortunately, the authors failed to describe how the therapists were trained and over what period of time, nor was there any follow-up to determine if the therapist's training carried over to children exhibiting aberrant behaviors who were not participants in the study.

By incorporating behavioral techniques into the physical therapist's repertoire, the therapist may be able to decrease negative behaviors that interfere with PT. Additionally, behavioral techniques such as positive reinforcement could result in higher rates of success and lead to greater treatment gains in fewer sessions.

The remainder of the chapter critically examines the literature regarding the use of behavior modification to promote the development of motor skills and to improve behavior and participation in PT. Early studies in the area (Fuller, 1949; Harris, Johnston, Kelley, & Wolf, 1964; Rice, McDaniel, & Denney, 1962; and Trotter & Inman, 1968) focused on using

behavior modification to promote changes in motor skills. It was generally concluded that such use of behavior modification in the treatment of persons with physical and mental disabilities was effective. As Manella and Varni (1981) pointed out, however, the use of behavior modification in physical rehabilitation can be used not only to promote optimal physical functioning, but also to promote modification of behaviors that often occur in children with long-term disabilities and that may interfere with PT. Literature on training behavior change agents is reviewed as well. The review concludes with a summary and critique of existing literature followed by a discussion of the hypotheses to be examined in this research.

Behavior Modification for Motor Skills

Perhaps the earliest reference to the use of behavior modification to increase movement in a person with a disability was made by Fuller (1949). Fuller described the use of operant conditioning with an 18-year-old male with profound impairment. By using a squirt of sugar-milk solution each time the subject moved his arm, Fuller was able to increase the rate of upper extremity movements from .67 per minute to 3 per minute.

Almost twenty years later, Foss (1966) described several studies that provided evidence for the successful use of behavioral techniques to control movement in humans, and suggested its use for children with cerebral palsy. Early literature addressing behavior modification with children who have cerebral palsy (CP) continued to focus primarily on the promotion of learning motor skills. Rice, McDaniel, and Denney (1962) described a single-case study in which reinforcement of arm movements was provided to a six-year-old boy with profound mental retardation. After they increased the operant rate of arm movements by rewarding the subject for any arm movements, the authors used ice cream as a reinforcer

to shape the response of reaching for a ring placed over the subject's bed. With ice cream as a reinforcer, the subject touched the ring over 700 times during a 45-minute period.

Early reports of the use of behavioral techniques in the PT environment were provided by Meyerson, Kerr, and Michael (1967). These authors presented four case studies demonstrating the use of behavior modification in a rehabilitation setting. The target behaviors included developing independent ambulation with two subjects, promoting on-task behavior during a typing task with one subject, and decreasing high rates of self-injurious and self-stimulating behavior with another subject. In each case, a behavior therapist designed and implemented specific interventions for each subject. Interventions included shaping target behaviors through successive approximation, providing positive reinforcement of target behaviors with attention from adults or edible rewards, and providing alternative sensory stimulation for non-injurious behavior. Each intervention was successful in achieving the target goal. However, the physical therapists and the occupational therapist who had been treating the children prior to the research intervention, were not incorporated into the study to learn the interventions themselves.

Trotter and Inman (1968) described the use of positive reinforcement to promote the performance of progressive resistance exercises in patients with paraplegia and quadriplegia involved in physical rehabilitation. By providing positive reinforcement in the form of attention from the therapist, and increased attention to appropriate rehabilitation goals by charting, the authors hypothesized that the group receiving positive reinforcement would achieve greater gains in their strengthening program. Indeed, a significant difference was found in the average increase in weights lifted for the experimental group versus the control group. However, due to several limitations of the study, the reasons for these differences could not be isolated. Differences between the control and experimental group

other than the use of positive reinforcement significantly limited the conclusions that could be drawn from this study. For example, half of the control group (subjects with quadriplegia) performed their exercises in the presence of and with the assistance of a nonprofessional who also provided attention in the form of “usual conversation.” The experimental group received attention from a trained physical therapist. Status, knowledge and experience of the physical therapist versus the nonprofessional aide could contribute to the differences observed. Additionally, the control group not only failed to receive positive reinforcement, but also failed to receive any prompting or advice to increase the weights being lifted. Such differences make it difficult to delineate which component of the treatment was most instrumental in creating change.

Trotter and Inman's (1968) assertion regarding the benefits of using behavior therapy techniques in the PT setting seemingly did little to promote the practice. In fact, when one considers the tremendous success in using behavior modification to effect motor skills as well as behavior in general, it is quite unfortunate that the PT literature remains limited in its presentation of the successful combination of behavior therapy and PT.

In the PT literature, Kolderie (1971) provided a brief literature review related to behavior therapy techniques and then described how behavior modification could be used with children with cerebral palsy to learn motor skills. A single-case study was described involving a seven-year-old, nonverbal female of average intelligence with mild spastic diplegia. At the time of the study, the child had a vocabulary of 10 words, could attain a sitting position with assistance, was learning to crawl, and could ambulate with maximum assistance. Using a poker chip reward system and immediate verbal reinforcement in physical, occupational, and speech therapy, the subject progressed to independent ambulation and established an age appropriate vocabulary. Over the course of treatment,

reinforcements were gradually shifted to natural contingencies. However, because there was no baseline or reversal of contingencies, the authors could not be conclusive in stating that behavior modification was the critical variable accounting for the changes in the child's behavior. Additionally, no follow-up assessment was done to determine if the progress continued. Furthermore, the author did not describe if the physical, speech and occupational therapists were trained to implement the intervention or if a behavior therapist conducted the treatment.

In a single-case design, Chandler and Adams (1972) used a behavior modification program to promote independent ambulation in an eight-year-old boy with multiple handicaps, who would not ambulate despite being physically capable of doing so. During the baseline period, the highest mean number of steps obtained from nine trials became the base rate. Implementation of the modification phase involved providing the child a reward of music or chocolate, contingent on exceeding the base rate from each previous session. Independent ambulation was achieved after twenty-eight sessions, and continued after the reinforcers were withdrawn. Several problems were evident in this study. Primarily, the target behavior being studied, number of steps, varied tremendously across time. Additionally, the target behavior had not achieved a stable rate during the baseline phase and before the intervention was begun. During the intervention, the number of steps could range between 37 and 85 over a span of about five days. This inconsistent performance led the investigators to change the reinforcement system three times. Another shortcoming of the study was an inadequately described baseline condition. It was not clear if the baseline condition was a true baseline based on a typical PT session, or if the setting, or the physical therapists' behavior (verbal encouragement or physical assistance) were different.

Bragg, Houser, and Schumaker (1975) examined the effects of rewarding appropriate sitting positions in children with cerebral palsy in a multiple baseline design across six children. Baseline sessions consisted of engaging the child in structured play during which no comments were made regarding the way the child was sitting. The percentage of appropriate and inappropriate sitting and the length of time spent in each position were recorded. The subjects were then randomly assigned to one group that received contingent praise, affection and food, or a second group that received consistent priming to sit with their legs in front of them in addition to the praise, affection, and food. Appropriate sitting was increased in all children and it was also believed to generalize to the classroom setting. However the authors failed to obtain a baseline rate of inappropriate sitting in the classroom prior to the study. Additionally, inappropriate sitting was not completely eliminated for any subject, and there was no follow-up phase to assess continued effects. The authors hypothesized that because the investigator played with the child regardless of how they were sitting they may have inadvertently reinforced inappropriate sitting positions.

Pierce and Garland (1977) used an extensive combination multiple baseline and reversal design to compare the effects of four interventions on promoting motor skills in six people with physical and mental disabilities. The four conditions were as follows: (1) prior instruction only before each motor task, (2) instruction plus social reinforcement when performing well, (3) instruction, social reinforcement, and material reinforcement, and (4) instruction, social reinforcement, and goal setting. Although each condition was differentially effective, social reinforcement and material reinforcement were found to be the most effective combination for increasing performance levels. This led the authors to conclude that the material reinforcement was the critical component in that intervention. Despite the proven effectiveness of the intervention, all subjects performance levels returned

to baseline once a procedure was removed. It was recommended that future studies assess how to maintain motor skills after reinforcement is removed.

According to Hester (1981) ambulatory deficiencies in children with profound mental retardation may be the result of misplaced reinforcement contingencies. He described how nonadaptive behaviors may be inadvertently reinforced, whereas, adaptive behaviors may not be reinforced at all. If indeed deficient skills had been learned through accidental conditioning, then Hester hypothesized that behavior modification using physical guidance and positive reinforcement could significantly affect change in such behaviors.

In a multiple-baseline design, Hester (1981) described how he used positive reinforcement consisting of physical, social, and edible rewards to increase the standing and walking behaviors of an institutionalized, 14 year old female, with profound mental retardation. During the course of training, as the child made progress, the physical and edible rewards were slowly withdrawn. A strength of this study was the addition of the generalization phase following the intervention, during which another staff member observed the procedure once before duplicating it for two 30-minute sessions each day. During the generalization phase, the behaviors initially decreased, but returned to appropriate levels. An additional strength in this study was the apparent use of the physical therapist in implementing the training. Unfortunately, despite the therapists attempt to train other staff members, the high staff turnover rate resulted in inconsistent use of the procedure. Thus, at two months follow-up, the child's behavior had returned to baseline.

Hill (1985) also presented a rationale for combining behavior modification techniques with PT in the habilitation of patients with cerebral palsy. Similar to Hester (1981), she described how a person with cerebral palsy can develop maladaptive motor function as a result of learning and interactions with the environment. More specifically, an

individual with cerebral palsy is likely to be limited motorically and thus lack opportunities to practice appropriate movements. Without an adequate foundation of basic motor skills, more complex motor skills may never be developed. In addition, because an individual with cerebral palsy may experience limited range of motion, weakness, and increased spasticity that may also cause increased pain, certain movements may actually be punishing. Thus, such an individual will adapt to these problems by avoiding those movements and developing abnormal movement patterns that are easier and likely to be reinforced with success and accommodate his/her abilities. Such behaviors are often maladaptive, and may be resistant to treatment.

Rapport and Bailey (1985) used a multiple-baseline design across outcome measures designed to assess fine and gross motor skills after implementing a home-based behavior therapy program combined with an existing PT program. The goals of the program were to increase compliance and improve fine and gross motor skills for an 8 year old with spina bifida. A unique addition to this study was the involvement of the parents, who were trained to use a variety of game-like tasks to practice the skills. In addition, a motivational chart was used to indicate those activities that were to be worked on each day and to display a point system for earning rewards for each task. Points could be exchanged for a variety of reinforcers at the end of each week. Although the authors concluded that the combined behavioral intervention with the existing PT program was successful, it was not possible to determine the factor(s) primarily responsible for the change. The improvement in this study compared to other studies reviewed was the use of a one-month follow-up period that indicated the performance gains had increased or remained stable.

There are several shortcomings in the existing literature on behavior modification and PT. First, the studies described only used behavior modification techniques to promote

the learning of motor skills. What has been lacking in the research conducted with children with developmental disabilities who receive PT, is the use of behavior modification to address behavioral problems that interfere with PT. A second shortcoming in several of the studies reviewed was the inability to conclude that the intervention provided was the primary factor affecting change. Third, several studies failed to provide follow-up data to verify that such behavioral techniques can provide a lasting effect. Finally there is a lack of attention to providing training to other people, such as parents and therapists, who are involved in the care and treatment of the children with physical disabilities.

Behavior Problems in PT

Perhaps it is because physical therapists focus on the development of motor skills and maximizing mobility that most studies have focused on the application of behavior modification to the learning of motor skills. However, another aspect of PT in which behavior modification techniques can be useful is in dealing with behavior problems. Behavior problems such as aggression, noncompliance, and tantrum behaviors, are frequently found in PT (Lalli, Mauk, Goh, & Merlino, 1994; Horner, 1971) and often interfere with progress in PT.

Horner (1971) reported the occurrence of aggression in a 5-year-old child with spina bifida and mental retardation, as the requirements for walking were increased. The subject had received surgical procedures to correct bilateral hip dislocations at the age of four. Following his surgery, he received PT on a regular basis that focused on strengthening exercises in preparation for walking. Despite ongoing PT, and having the physical capabilities to ambulate, attempts at enforced ambulation were met with increased negative behaviors such as tantrums and resistance.

Initially, Horner used a reversal design with a six-step successive approximation sequence to establish the use of parallel bars to assist with walking. Root beer had proven to be a reinforcer during the baseline phase. When the child was ambulating independently in the parallel bars, an extinction procedure was initiated demonstrating control of the reinforcement contingency over the behavior. Following the extinction period, the subject received a “free” reinforcer and returned to the final step in the initial treatment period.

After ambulation was obtained in the parallel bars, the use of crutches was established using a ten-step successive approximation sequence. During the baseline phase for this stage of the treatment, aggressive behaviors started to occur, such as throwing crutches and tantrum behavior. The subject was prevented from throwing the crutches by securing them to his hands with elastic bandages, and a 3-minute time out was enforced contingent upon his aggressive behavior. Although systematic records of the subject's resistive behavior were not kept, the author stated that these behaviors responded to the time-out and use of restraint. Also during this phase of treatment, the reinforcer was changed after session 54 from root beer to noise that the subject was allowed to make after a trial was successfully completed. This was reportedly due to the difficulty in being able to immediately reinforce correct responses. Independent ambulation was achieved, after which a contingency management program was designed to ensure continued independent ambulation. The sound methodology allows one to conclude that behavior modification was indeed the critical variable in training this child to ambulate independently in the parallel bars.

In a single-case study, Manella and Varni (1981), described a four and one-half-year-old girl with myelomeningocele who presented with a short attention span, tantrum behaviors and refusal to walk during PT. Using social attention, affection, and game playing,

positive reinforcement was contingent upon the partial performance of certain motor skills. As the child became more skilled, the amount of assistance needed was decreased, and independence was reinforced. All inappropriate behaviors were ignored. After the child exhibited appropriate behaviors in PT, the child's mother was trained in the behavioral techniques for home use. Results indicated that the child reached the therapeutic goals set by the physical therapist. Additionally, the mother was effective in implementing the behavioral program in the home resulting in continued progress. As might be expected, the child's ambulation deteriorated when the mother began implementing the program, but quickly returned to and then exceeded the performance she had obtained with the physical therapist. A limitation of this study was that the frequency of the problem behaviors that had previously been exhibited before the onset of the study were not mentioned after the initial description. The occurrence of the behaviors was not documented in the study other than to state that they were ignored. Thus, it is not known if these behaviors were eliminated before, during, or after the intervention, or were not eliminated at all. However, a strength of the study was training the parent in the application of the behavioral technique. Such training was an essential component in the treatment, and one that has rarely been addressed in the literature.

Training Programs in Behavior Modification

Programs that train parents and healthcare professionals in behavioral procedures for children have been shown to promote more positive parent-child interactions at home and optimize health care provision in the hospital (Eyberg, Boggs, & Algina, 1995; Babbitt et al., 1994; Singer, Nofer, Benson-Szekely, & Brooks, 1991). Parent training has probably received the most attention in the literature. Various child-treatment procedures have been taught in parent-training programs. Most frequently, parents have been trained to apply

differential reinforcement either as the only form of treatment or with other procedures (Budd, Green & Baer, 1976). One of the key advantages of using a behavioral approach to deal with the behavior problems of children is the relative ease with which an individual who may have relatively little skill in the use of sophisticated therapy techniques can learn and implement the basic principles of behavior change (Riley, Parrish, & Cataldo, 1989).

One of the most common parent training approaches involves the use of modeling, practice and immediate feedback (e.g., Forehand and King, 1977). Parent-child interaction therapy (PCIT; Eyberg & Matarazzo, 1980; Eyberg, Boggs, & Algina, 1995) for example, was developed to treat children with conduct problem behaviors and their families. In PCIT, the therapist models for the parents certain skills to be learned. The parents then practice the skills with their child, while receiving feedback through a bug-in-the-ear device. Following each session, the therapist provides feedback to the parent regarding their performance. PCIT outcome research has demonstrated statistically and clinically significant improvements in child problem behavior (Eisenstadt, Eyber, McNeil, Newcomb, & Funderburk, 1993; Eyberg, Boggs, & Algina, 1995; Eyberg, Robinson, 1982).

Hudson (1982) conducted a component analysis of a group training program for parents of children with developmental disabilities to teach their children new skills. Forty mothers were randomly assigned to one of four treatment groups: verbal instruction, verbal instruction plus the teaching of behavioral principles, verbal instruction plus the use of modeling and role-playing with immediate feedback, and a wait-list control group. Results indicated that the inclusion of modeling, role-play, and feedback led to significantly greater improvement in the ability of parents to develop new skills in teaching their child.

Eyberg and Matarazzo (1980) compared two types of training to promote behavior management skills in mothers. The didactic group received five, 90-minute sessions where

they were taught the principles and application of behavioral techniques. Mothers in the individual interaction group were trained in the basic rules of two components of parent-child interaction. The rules were taught to the mothers in five, 20-minute sessions, using description, modeling, interaction and feedback. Results indicated that mothers in the interaction group improved significantly on all targeted behaviors.

“Train the trainer” techniques are perhaps an inevitable extension of the research demonstrating the effectiveness of behavioral approaches to change human behavior. Trainers, or behavior change agents, that have been studied include teachers to increase social interactions (Hendrickson, Gardner, Kaiser, & Riley, 1993), institutional attendants to apply behavioral techniques (Gardner, 1972), graduate students to train parents (Isaacs, Embry, & Baer, 1982), medical residents to increase communication skills (Branch, 1990), and foster grandparents working with institutionalized children (Fabry & Reid, 1978).

Research on training the trainer has frequently focused on the most effective ways to train others in the implementation of behavioral techniques (Bernstein, 1982). In a review of consumer satisfaction in parent training programs, practice with the child was found to be the most useful training tool, followed by performance-oriented teaching, and trainer demonstration. The use of written materials was found to be least useful (McMahon & Forehand, 1983). Gardner (1972) found role playing to be more effective than lecture in teaching behavior modification techniques to nonprofessionals. Cunningham, Davis, Bremner, Dunn, and Rzasa (1993) found modeling, role play, and homework most useful in promoting mastery of new skills. Hosford and Johnson (1983) found that using the self-as-model technique, with only appropriate behavior viewed, resulted in completely extinguishing inappropriate interviewing behaviors in counselors.

It is generally agreed upon that instruction alone is insufficient to teach behavior change skills (Bernstein, 1982; Delamater, Connors, & Wells, 1984; McMahon & Forehand, 1983). However, sufficient support exists for modeling (Bandura, 1969; Cunningham et al., 1993), rehearsal, role play, and feedback (Delamater, Connors, & Wells, 1984).

Modeling has repeatedly been shown to be a powerful technique for behavior change. Effective modeling has been used to teach speech and language skills (e.g. Charlop & Milstein, 1989), improve interviewing skills (e.g. Miltenberger & Veltum, 1988), acquire motor skills (e.g., Carroll & Bandura, 1985), reduce avoidant behavior (e.g., Meichenbaum, 1971), teach parenting skills (e.g., Webster-Stratton, 1981), and reduce child uncooperative behavior (e.g., Stokes & Kennedy, 1980). Symbolic modeling in the form of videotapes was the logical outgrowth of the documented effects of live modeling. Videotape modeling has several advantages over live modeling, including the ability to create naturalistic modeling sequences, greater control over creating the modeling scene, ability to present multiple models or repeated observations of the same model, efficiency, and self-administered treatment sessions (Thelen, Fry, Fehrenbach, & Frautschi, 1979).

For a videotape model to be effective, the modeling procedure should focus on the skill to be learned, its context, and its consequences. Bandura (1969) identified four components that mediate observational learning: attention to modeled events, retention of what is observed, ability to replicate modeled behaviors, and motivation to reproduce those behaviors. The characteristics of the model contribute to the effectiveness of the procedure. Model characteristics such as competence (Baron, 1970), status level (McCullagh, 1986), age (Bandura & Kupers, 1964), and similarity (Kazdin, 1974) have been shown to strengthen the degree of observational learning.

The empirical evidence for the use of videotaped modeling allows it to stand alone as an effective intervention in its own right. However, packaging it with other effective interventions, especially with opportunities to practice, should be even more effective (Dowrick, 1991). Bandura (1971) suggested that the effects of modeling could have a greater impact if it were followed with guided practice or rehearsal in a natural environment.

In his review of the parent training literature, O'Dell (1985) argued that the best parent training programs have been a combination of visual, verbal and interactive training methods. Kazdin (1994) also promoted the use of multicomponent interventions for several reasons: (1) combining individual techniques that have been shown to be effective should strengthen their impact; (2) a combination of techniques may increase the rate of skill or knowledge acquisition; and (3) a multicomponent intervention may be able to address a range of problems that often occur together.

Forehand and King (1977) used cueing, feedback, instruction, role play, and practice with feedback to train parents of noncompliant children. After observing the parent-child interaction, the parent was instructed on ways to change his/her behavior to increase the child's compliance, and the therapist modeled these behaviors. The parent was then able to practice the skills with the therapist who provided feedback. Finally, the parent used the skills in playing with his/her child while receiving further feedback from the therapist via a bug-in-the-ear device. Results indicated that the behavioral criterion for the study were achieved in an average of nine sessions. Additionally, follow-up assessments indicated that the behavior changes were maintained at three months.

Matson and Stephens (1978), and Delamater, Connors, and Wells (1984) used training interventions that included modeling, behavioral rehearsal and feedback to train staff to use behavioral techniques in their interactions with children on an inpatient

psychiatric unit. Webster-Stratton (1990) found greater effectiveness in decreasing deviance in children through the use of videotaped modeling plus therapist consultation for parents.

This chapter has described the literature on the use of behavior modification in the field of PT, primarily with children. Behavior modification has been used most frequently to facilitate the learning of new motor skills. Although few in number, research studies have been conducted demonstrating the use of behavior modification to address behavior problems of children during PT. However, the behavior change agents in such studies were most often a behavior specialist and the physical therapists were rarely trained in the behavior modification techniques. This type of approach continues to leave the physical therapist without the skills necessary to deal effectively with the behavior problems that frequently occur in the PT setting.

A review of the literature on effective components for training nonprofessionals in behavior modification techniques was also described. It has been well established that parents, teachers, psychiatric technicians, and therapists can successfully learn and implement behavioral techniques (O'Dell, 1974; Eyberg & Matarazzo, 1980; Harris, Johnston, Kelley, & Wolf, 1964; Rapport & Bailey, 1985; Gardner, 1972). Successful training components include modeling (O'Dell, 1974), videotaped modeling with behavior therapist feedback (Webster-Stratton, 1990), practice and immediate feedback (Eyberg & Matarazzo, 1980).

Based on the repeated success of training behavior change agents through the use of modeling, rehearsal and feedback, it seems likely that a training intervention combining these practices would be an ideal training package to promote the acquisition of a new skill. The present study used a training module, Strategic Interaction Training (SIT), that incorporates videotaped modeling, individual interaction training, and feedback and reinforcement to

determine if physical therapists can learn to use behavior analysis and therapy reduce behavior problems in children during PT. SIT was modeled in part, after Parent-Child Interaction Therapy (Eisenstadt, Eyber, McNeil, Newcomb, & Funderburk, 1993; Eyberg, Boggs, & Algina, 1995; Eyberg, Robinson, 1982). To date, no other work has trained physical therapists to apply general behavioral techniques to the problem behaviors that occur in PT.

Compared to previous studies involving the use of behavior therapy in PT, the current study differs in several ways. First, in this study, the physical therapists were directly trained to use behavioral modification techniques to effect change in the behavior problems that children present with during PT. Second, multiple PTs were trained in these skills, and the outcome is assessed across several children. Finally, two very different settings, an outpatient and inpatient setting, were used to demonstrate the generalizability of such training.

SPECIFIC AIMS AND HYPOTHESES

This study specifically focuses on training physical therapists in behavior analysis and therapy to decrease resistant, noncompliant and aggressive behaviors in children during PT and to increase child compliance rates. The training intervention, Strategic Interaction Training (SIT), was the independent variable of interest. Dependent variables were the frequency of target behaviors coded for both the physical therapist and the child across sessions, and social validity measures. It was believed that the results of this study would: (1) identify problem behaviors that physical therapists frequently encounter; (2) show that physical therapists can learn to use behavior analysis and therapy; (3) demonstrate that the use of behavioral techniques by the physical therapist will result in a decrease of negative behaviors in the children receiving PT.

Specifically, the following hypotheses were tested regarding the aforementioned variables:

Therapists Target Behaviors

(1) Prior to SIT, it was expected that physical therapists would exhibit low frequencies of the following behaviors: praise, direct command, ignore, attention to appropriate behavior.

(2) It was hypothesized that physical therapists could learn to implement behavioral techniques to address problem child behavior. Specifically, it was expected that the physical therapist would increase rates of the following behaviors to a pre-determined goal level: praise, attention to appropriate child behaviors, ignore, and direct commands.

(3) Additionally, in follow-up sessions, it was hypothesized that the training would promote the use of the skills with other children who present with negative behaviors in PT.

Child Target Behaviors

As a result of the physical therapists training, the following hypotheses were made regarding the behavior of children being treated.

(4) Child compliance rates would increase.

(5) Child inappropriate behaviors (e.g., whining, crying, aggression, pain behaviors, yelling, and smart talk) would decrease.

Consumer Satisfaction Predictions

(6) On a measure of consumer satisfaction, it was predicted that the physical therapists receiving SIT would rate it as an acceptable, effective, and beneficial training module to reduce behavior problems in children and increase compliance during PT.

METHOD

Participants

Four currently practicing, licensed pediatric physical therapists provided informed consent and participated in the training. There were two therapists from an outpatient setting and two therapists from an inpatient setting. All physical therapists were Caucasian females and had received a bachelors degree in PT. The average number of years practicing PT was 15 years and 3 months (range 6 – 20 years). The average number of years practicing PT with children was 11.5 years (range = 6 – 18 years). One therapist from each site was certified in neurodevelopmental therapy (NDT). One therapist at Shriners treated three children in the study, one therapist at All Children's Therapy Center treated two children while the other two therapists each treated one child at each site.

Table 1 presents information on the children and the grouping of children with each therapist. A total of 7 children were recruited for the study, 4 from Shriners Hospital and 3 from All Children's Therapy Center. The parent(s) of each child provided informed consent to participate, and for those children over 7 year of age, assent was obtained from the child. Six children were Caucasian, one child, Sherry, was African American. There were 3 males and 4 females, and they ranged in ages from 3 years to 12 years old ($M = 7.9$). Each child was nominated by his/her physical therapist, who was also participating in the study, based on the presence of behavior problems that interfered with the process of PT. Children in the inpatient setting had been working with their therapist for 1-2 months prior to entering the study. Children in the outpatient setting had been working with their therapists for

Table 1

Child demographics, diagnosis and behavioral issues grouped by treating therapist.

Therapist	Participants	Gender	Age	Medical Diagnosis	Behavioral Issues	Number of Post-SIT sessions
1 Shriners Hospital	Sierra	F	8	multiple congenital anomalies including tibia hemiamelia with resultant leg length discrepancy on left, treated with an orthofix	whining, noncompliance, lack of independence with exercises	10
	2 Sherry	F	8	spastic diplegic cerebral palsy; status post bilateral hamstring lengthening	screaming, crying, noncompliance, aggression	9
	3 Ron	M	12	Legg-Calve Perthes disease of the left leg; status post left adductor release and varus derotational osteotomy approximately 5 months prior to his admission; ADHD	noncompliance, impulsivity that was disruptive to the flow of PT, and whining	4
2 Shriners Hospital	Alan	M	3	spastic quadriplegic cerebral palsy; status post bilateral adductor releases and bilateral tendo achilles lengthening	refusing to walk, screaming, tantrums; easily distractible	6
	3 Katy	F	8	spastic diplegic cerebral palsy and a seizure disorder	suddenly becoming very limp and falling over or collapsing, whining, noncompliance, talking back to the therapist and crying	9
	4 All Children's Therapy Center	M	9	spastic diplegic cerebral palsy; status post bilateral hamstring lengthening	whining, talking back to the therapist, aggression, and general noncompliance	9
	Mary	F	7	Downs syndrome, juvenile rheumatoid arthritis, and neurofibromatosis.	noncompliance, and talking back to the therapist	3

approximately two years prior to their involvement in the study. Child behavior problems included noncompliance, whining, screaming, aggression, becoming limp and falling over or falling to the floor, talking back to the therapist, and dawdling.

Because of the need for the child to understand language in order to assess compliance with therapist requests, children with a history of moderate to severe mental retardation were not included and the ability to understand therapists requests was determined by observing the child/therapist interactions prebaseline. If any therapists achieved training criterion during the first two baseline sessions on the target behaviors to be described they were excluded from the study. No therapist met all criterion during baseline.

Setting

Participants were recruited from and treated in two different settings. Two physical therapists and four children were recruited from Shriners Hospital for Children in Tampa, Florida. Shriners is a 60-bed pediatric orthopedic, inpatient hospital that serves children from around the state of Florida, southern Georgia, and the Caribbean. For the purposes of this research, PT was conducted in a smaller gym adjacent to the main treatment gym and away from the noise and distractions of other people. This was done for several reasons. First, by using a quieter room, we were able to obtain a better sound for coding therapist and child behaviors. Second, it prevented the first therapist from influencing the second therapist's behaviors after completing the intervention. Finally, baseline and treatment were both conducted in the smaller gym in order to maintain a stable environment during baseline and the intervention. Ambulation activities occurred in the main hall, which was typical for that setting. Because Shriners Hospital is an inpatient rehabilitation setting, each child was

seen for PT every day, excluding weekends. The time at which each child was seen during the day was relatively constant throughout the research, and each child was seen an average of 60 minutes, 5 days a week.

Two therapists and three children were recruited from All Children's Therapy Center, an outpatient therapy center affiliated with a large children's hospital located in St. Petersburg, Florida. Physical therapy at All Children's Therapy Center was conducted in one large room, often with other children and therapists present. Because of the physical layout of the setting, it was not possible to separate the therapists. Two children were scheduled for PT once a week, one for thirty minutes and one for one hour, and one child received PT three times a week for thirty minutes each. Additionally, one child scheduled for PT once a week, had a very high no-show rate resulting in the therapist having less consistent opportunities to utilize her skills with this child and implement feedback she received on a regular basis. Both PT departments were equipped with similar PT equipment, which included bolsters, therapy balls, mat tables, and small staircases.

Measures

Observational Measures

Each PT session was videotaped during all phases and coded for target behaviors to be described below. The coding system consisted of portions of the Dyadic Parent-Child Interaction Coding System - II (DPICS-II; Eyberg, Bessmer, Newcomb, & Edwards, and Robinson, 1994), and revised portions of OTIS (Observation, Training, and Interaction System-revised; Stokes & Mowrey, 1999), which was adapted from the Systematic Carousel Observation of Performance (SCOOP; Osnes & Stokes, 1987), as well as the addition of a

pain behavior category that was not covered under DPICS-II or OTIS. Two sequences of behavior were also coded: 1) the child's response to the therapist's commands and 2) the therapist's response to the child's inappropriate or pain behavior.

The DPICS-II is a revised and expanded version of the DPICS (Eyberg & Robinson, 1983), a behavioral coding system designed for the assessment of the quality of parent-child social interactions. It was originally designed to be used as a pretreatment and posttreatment observational measure, as well as a measure of treatment progress and outcome. DPICS-II and its categories were designed for multiple purposes and can be modified depending on the needs of the user. Its reliability and validity have been well supported in a recent study by Bessmer (1996), who found that the reliability estimates of the DPICS-II codes used in this study fell in the good (% agreement >70%; kappa = .60 - .75) to excellent (kappa >.75) range.

The SCOOP (Osnes & Stokes, 1987) was originally designed to be used in diverse settings as a measure of the contingencies in effect in various situations. OTIS was adapted from SCOOP and was designed for a program serving children with physical impairments. There are no existing data on the reliability or validity of this observation and coding system.

Behavioral Definitions

The child behaviors that were coded included responses to commands, inappropriate behavior, and pain behavior and were defined as follows:

Compliance (CO; DPICS-II). Compliance with instructions or commands was coded when the child obeying or beginning to obey a command within 5 seconds after it was given.

Noncompliance (NC; DPICS-II). Noncompliance is coded when the child does not begin to complete an instruction, or demonstrates a behavior that is clearly incompatible with compliance of a command within five seconds of the request.

No opportunity (NOC; DPICS-II). After a therapist issues a command, the child has five seconds to respond. No opportunity is coded when the child is not given an adequate chance to comply either because the therapist completes the behavior for him/her, or the command is clearly out of the range of the child's ability.

Inappropriate behaviors (IB; OTIS). Inappropriate behavior includes behavior that is distracting, off-task, or disruptive including crying, whining, yelling, smart talk, aggression. Crying consists of inarticulate utterances of distress (audible weeping) at or below the loudness of normal conversation. Whining consists of words uttered by the child in a slurring, nasal, high-pitched, falsetto voice. Yelling consists of a loud screech, scream, shout or loud crying. The sound must be loud enough so that it is clearly above the intensity of normal indoor conversation. Smart talk consists of impudent or disrespectful speech. Aggression is any physical touch that is intended to be antagonistic, aversive, hurtful, or restrictive of the therapists activities, or harmful to self, or environment.

Pain behaviors (PB; SIT). Pain behaviors include obvious grimacing, vocalized complaints of pain such as yelling out about pain, whimpering, or crying related to pain. Inappropriate behaviors and pain behaviors are coded according to the therapist response that follows.

Therapist behaviors that were coded included:

Direct command (DC; DPICS-II). A direct command is a clearly stated order, demand, or direction in declarative form. The statement must be sufficiently specific as to indicate the behavior that is expected from the child.

Indirect command (IC; DPCIS-II). An indirect command is an order, demand, or direction for a behavioral response that is implied, nonspecific, or stated in question form.

Praise (P). Praise includes any specific or nonspecific verbalization that indicates liking, approval, or expresses a favorable judgment upon an activity, product, or attribute of the child (DPICS-II; combination of labeled and unlabeled praises).

Ignore (I; OTIS). Ignore is coded when the therapist does not provide any evidence of having heard or seen an inappropriate behavior that occurs (passive ignore); or the therapist may take action by withdrawing attention, withdrawing physically from the child, turning away, or removing an object from the child's reach without responding to the inappropriate or pain behavior (active ignore).

Physical guide (PG; OTIS). If the child is noncompliant following a command, the physical therapist physically guides the child to complete the command with minimal physical contact. This could include pushing a child's walker forward so that the child will continue walking or guiding the child's hand using a hand-over-hand motion to reach for an object.

Inappropriate behavior or pain behavior followed by attention (A- or PBA; SIT). Inappropriate behavior or pain behavior followed by attention is coded when a therapist talks to the child or provides physical touch, other than is therapeutically necessary, when the child is exhibiting inappropriate behavior or pain behavior. This includes negotiating (offering a reward such as a desired toy, the presence of a parent, or an activity contingent on performance), "threatening" (a specific verbalization indicating a negative consequence will follow a behavior) the child, or commenting on or questioning the child's inappropriate or pain behavior.

Inappropriate behavior or pain behavior followed by ignore (I- or PBI; SIT).

Inappropriate behavior or pain behavior followed by ignore occurs when a therapist removes attention by withdrawing from the child, turning away from the child, ceasing verbalization with the child, or not providing any evidence of having seen or heard the inappropriate or pain behavior exhibited by the child.

Inappropriate behavior or pain behavior followed by escape (E- or PBE; SIT).

Inappropriate behavior or pain behavior followed by escape is coded when the therapist discontinues an activity, demand situation or therapy for more than 30 seconds due to inappropriate child behavior or pain behavior or when an activity is completely terminated due to inappropriate or pain behavior.

Attention following appropriate child behavior (A+; SIT). Talk or physical contact with the child occurring before, during, or after appropriate child behavior is coded as attention following appropriate child behavior.

Summary Behaviors

Two behavior categories, while initially coded separately, were combined in the final summary of behaviors. Attention to pain behavior was subsumed within attention to inappropriate behaviors. Although it is certainly recognized that pain often occurs during physical therapy and can be an important indicator for physical therapists to assess pathology or the extent to which a patient can be pushed in his/her exercises, depending on the response following a pain behavior, pain behaviors can also serve as a nurturance trap for attention and escape (Stokes, Mowery, Dean, & Hoffman, 1997). The criterion level for ignoring inappropriate behaviors still allowed for therapists to acknowledge 25% of pain behaviors.

Coder Training

The primary author served as the primary coder. A second coder who was blind to the research hypotheses, served as a reliability coder. Before beginning to code videotapes for the current study, each coder completed a minimum of 30 hours of training. Coder training consisted of (1) reading and studying relevant portions of the DPICS-II Manual (Eyberg, et al., 1994) and the OTIS behavioral definitions. (2) discussion of DPICS-II, OTIS, and the other behaviors described; and (3) successfully completing quizzes that pertain to each category of the DPICS-II system in The Workbook: A coder training manual for the Dyadic Parent-Child Interaction Coding system II (Eyberg, Edwards, Bessmer, & Litwins, 1994). Quizzes involving behavior codes not covered in the DPICS II training manual were also provided by the primary author. After obtaining 90% on all quizzes of relevant behaviors, the reliability coder practiced coding videotapes that had been coded and transcribed by the primary coder. Training was considered complete when the reliability coder met 80% agreement with the primary coder on two consecutive criterion tapes. The reliability coder and the primary coder met on a weekly basis throughout the study to practice coding and discuss differences during practice sessions.

Behavioral Coding

Each session during baseline, intervention, and follow up was videotaped in its entirety and coded for therapist and child behaviors. The outpatient, thirty-minute sessions, were blocked into five-minute segments. The 2nd, 4th, and 6th five-minute segments were coded for target behaviors. During the inpatient sessions that could be one hour or longer, sessions were blocked into ten-minute intervals followed by five-minute intervals throughout the session. Frequency coding for target behaviors was conducted during each five-minute interval. This allowed for a sample of behavior to be coded from the beginning, middle, and

end of each PT session. Frequencies were summed for each behavior category and percent occurrence or rate per minute was calculated. Percent occurrence was calculated by dividing the frequency of a specific category, such as direct commands by the total frequency of the behavior category, such as total commands, in each session. The observers and the video camera were present for several sessions before initiating data collection to allow the participants to adapt to the novelty of a new person and the camera. The PT session and timing began when the patient entered the PT gym, and terminated when the patient exited the gym at the end of therapy.

Treatment Integrity

The primary author conducted the training intervention with each therapist using a detailed procedural outline (see Appendix A). Undergraduate research assistants recorded treatment integrity data from videotapes of each training session using the outline of the intervention in checklist format. Each intervention session was videotaped and coded for integrity. Percent agreement was calculated by dividing the number of agreements by the number of agreements plus disagreements. Treatment integrity was 100%, indicating that the intervention was implemented exactly as it was outlined and indicating a high degree of fidelity with the SIT protocol.

Reliability

Thirty percent of all intervention sessions were randomly selected to be coded independently by an undergraduate research assistant to assess reliability. The undergraduate research assistant was naïve to the purpose of the investigation. Percent agreement was calculated by dividing the number of agreements by the number of agreements plus disagreements on occurrences only. Interrater reliability using Cohen's

kappa (k; Cohen, 1960), which takes into account chance agreement and is thus a more stringent reliability measure was also assessed. Reliability was calculated on each behavioral category and data are presented in Table 2.

The mean interrater reliability coefficient was obtained for each behavior category and ranged from 77% – 100% and kappa ratings ranged from .82 - .96. Inappropriate or pain behavior followed by escape was a very low frequency behavior resulting in an average percent agreement of 50% and thus was removed as a dependent variable.

Table 2

Summary of reliability for behavior categories

Behavior category	% agreement	Kappa
Direct Command	91	.94
Indirect Command	88	.93
Compliance	85	.91
Noncompliance	77	.86
No Opportunity for Compliance	83	.89
Inappropriate Behavior followed by		
Attention	85	.91
Ignore	83	.90
Physical Guide	80	.87
Attention to appropriate behavior	93	.94
Praise	93	.96
Warning	100	1.00

Demographics and Medical History

A demographics and medical history form (see Appendix B) documenting the child's age, gender, medical history, and goals for PT was completed by each physical therapist. In addition, the therapists provided information regarding their educational background,

number of years practicing as a physical therapist, number of years working with children, and whether they were NDT certified.

Consumer Satisfaction Questionnaire

Therapist satisfaction with the treatment intervention was evaluated using the Consumer Satisfaction Questionnaire (see Appendix C). This 13-item questionnaire was administered to each therapist to evaluate various aspects of the training on a 5-point scale (1 = negative, 5 = positive), such as relevance of the training intervention, time commitment needed for the intervention, and whether or not the therapist perceived behavior changes in the children. The questionnaire also included four open-ended items that requested the therapist to provide feedback on the degree to which the intervention was acceptable to them, the most helpful and least helpful aspects of the training, along with any other feedback for the improvement of Strategic Interaction Training.

Procedure and Design

A multiple-baseline design across children and therapists (Baer, Wolf, & Risley, 1968) was used in each setting to evaluate the effect of Strategic Interaction Training on therapist and child behaviors. A multiple baseline design allows for the visual inspection of the data, allowing the reader to quickly see the relationship of one set of data to another set of data. The visual analysis of data tends to be more conservative and is thus commonly used to assess variables that may impact behavior rather substantially (Parsonson & Baer, 1992). Additionally, the multiple baseline design is tailored for unique, applied settings and circumstances when only small numbers of participants are available.

The study was first conducted in an inpatient setting with three children being treated by Therapist 1 and one child being treated by Therapist 2. Baseline data were gathered on the target behaviors for each Therapist/Child dyad. Because of the multitude of

target behaviors, it was difficult to achieve a point in the baseline where all target behaviors were stable. The intervention occurred with Therapist 1 when a stable baseline occurred for the majority of target behaviors and baseline observations continued for Therapist 2. Once the behavior of Therapist 1 showed a clear change on the target behaviors, Therapist 2 received the intervention. This design was replicated in the outpatient setting, where Therapist 3 who was treating one child, received the intervention first, followed by Therapist 4 who was treating two children. To assess generalization of the therapists skills across time and with non-targeted children, follow-up data were also collected one month postintervention. Thus, this study involved two multiple baseline designs with three phases: baseline, intervention, and follow-up on therapist skills.

Baseline

During the baseline phase, therapists were instructed to conduct their PT sessions as usual. No other instructions or recommendations were provided. Each PT session varied between children but was similar for each individual child across sessions, and was based on each child's individual PT goals. This most often consisted of requests to perform multiple repetitions of strengthening and range of motion exercises, and ambulation activities. Play activities were often incorporated into each PT session.

Intervention

The Strategic Interaction Training was conducted in three phases:

Phase one –Didactic training and modeling videotape

During this phase, the physical therapists viewed a videotape of another female physical therapist providing PT to two different children who exhibited a variety of negative behaviors such as crying, noncompliance, and resistance. The therapist in the videotape

modeled the use of the following behavioral techniques for which participating therapists would receive training: direct commands, praises, attention contingent upon appropriate behaviors, and ignoring inappropriate behaviors.

The physical therapist and the behavioral consultant, the experimenter, then discussed the definitions of target behaviors and the rationale for the therapist's target behaviors. The therapist was provided with a handout of behavioral definitions (see Appendix D) in order to promote concurrent use and understanding of the language being used to define behaviors.

The basic guidelines of a behavior analysis and therapy approach with an emphasis on differential reinforcement were then reviewed. Therapists were instructed to ignore all inappropriate behaviors, provide positive reinforcement in the form of praise and attention contingent upon compliance and positive behaviors, use time-out or a physical guide for noncompliance, use clear, concise and age appropriate commands to direct the child's behavior, and be consistent in the use of the techniques. This didactic and modeling phase typically took 90 minutes to complete.

Phase two –Interactive training

Following Phase 1, the therapists practiced their skills by providing PT to non-target children. After a ten-minute warm-up period, the therapist's behavior was coded for the next five minutes without receiving prompts or feedback. The primary author provided prompting and feedback for the remainder of the session to help shape the therapist's appropriate use of the behavioral techniques. Additionally, target behaviors of the child were labeled to facilitate the identification of behavior problems.

Following each PT session, the therapist received prompt verbal feedback on her overall performance. Criterion for discontinuing Phase 2 included the therapist providing

75% of all praise and attention contingent upon appropriate behavior, 75% of all requests for action were direct commands, and 75% of negative behaviors were ignored during the five minute segment that was coded. Therapist 2 had four practice sessions during this phase, and Therapists 1, 3, and 4 all had five practice sessions. Each practice session averaged one hour.

Phase three –Feedback

When the therapist reached criterion, she resumed PT with the target children from the baseline period. All sessions continued to be videotaped. Each session began with a brief reminder of the behavioral goals for that session based on the observations from the previous session. The therapist then received feedback only at the end of each session. Because of the time constraints on the therapists at All Children's Therapy Center, the therapists frequently received feedback from the author via telephone, or occasionally by fax. This phase lasted until the completion of the research. However two children were discharged prior to the end of this study and thus have limited data intervention.

Follow Up

A follow-up observation period was attempted with each therapist approximately one month after completing the training to test the hypothesis that the intervention allowed the therapists to generalize their skills to other non-target children. Each therapist was observed during 2-5 PT sessions with different children. Each session was videotaped and coded for therapist target behaviors only for comparison across baseline and intervention data. Because of difficulty in scheduling these sessions, and in recruiting appropriate participants, some follow-up sessions were not conducted until 8 months postintervention.

RESULTS

Percent occurrence or rate per minute was calculated for each of the child and therapist target behaviors. Percent occurrence was calculated by dividing the total frequency of a behavior by the total number of occurrences in the general behavior category for each session. For example, to calculate the percent occurrence of direct commands for each session, the frequency of direct commands was divided by the total number of commands (direct and indirect). Results are summarized first across all therapists and children in relation to the original hypotheses and then compared between the two settings in which the study was conducted.

Therapist Behaviors

Direct commands. The percent occurrence of direct commands for all dyads is shown in Figures 1 and 2. During the intervention phase, all four therapists exceeded the goal level for 75 percent of all commands to be direct. Prior to the intervention the average percent occurrence for direct commands was 62 percent (range = 42% - 80%) (see Table 3). During the intervention the average percent of direct commands increased to 83 percent (range = 79% - 87%). In the inpatient setting, therapists increased their direct commands an average of 27 percent, while therapists in the outpatient setting increased their direct commands by 15 percent. Therapist 1 (with Ron) and Therapist 4 (with Bryan) had already attained the goal level for direct commands prior to the intervention. Additionally, Therapist 4 demonstrated an upward trend during baseline. As can be seen in the multiple baseline

Table 3

Mean occurrence of target behaviors at baseline and intervention for all therapists.

Behavior Category	Baseline	Intervention
Direct Commands	62%	83%
Compliance	82%	88%
Noncompliance	16%	12%
No opportunity for compliance	55%	39%
Inappropriate child behavior	1.4/min	1/min
Praise	1/min	2.7/min
All attention to appropriate child behavior	81%	96%
Inappropriate child behavior followed by ignore	20%	78%

design, the increase in direct commands for Therapist 2 did not occur until after the intervention, and follows the increase in direct commands attained by Therapist 1. The upward trend demonstrated by Therapist 4 with Bryan began after the intervention had already been implemented with Therapist 3. However, Therapist 4 did not reach the goal level with Mary during baseline and, in fact, had a downward trend with Mary.

Inappropriate behavior followed by ignore. The percent occurrence for ignoring inappropriate child behaviors was calculated by dividing the number of inappropriate child behaviors that were ignored by the total number of inappropriate behaviors followed by ignore plus attention. The percent occurrence of ignoring inappropriate child behavior for each child/therapist dyad in the inpatient setting is shown in Figures 3 and 4. If there was no inappropriate behavior during a session to ignore, then no data point is present in the graph. All four therapists demonstrated significant increases in ignoring inappropriate behavior

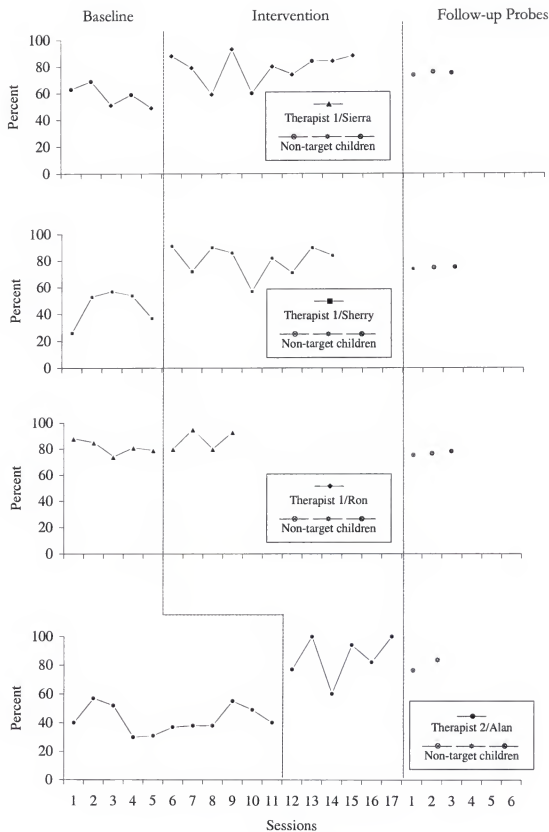


Figure 1: Percent occurrence of therapist direct commands--inpatient setting

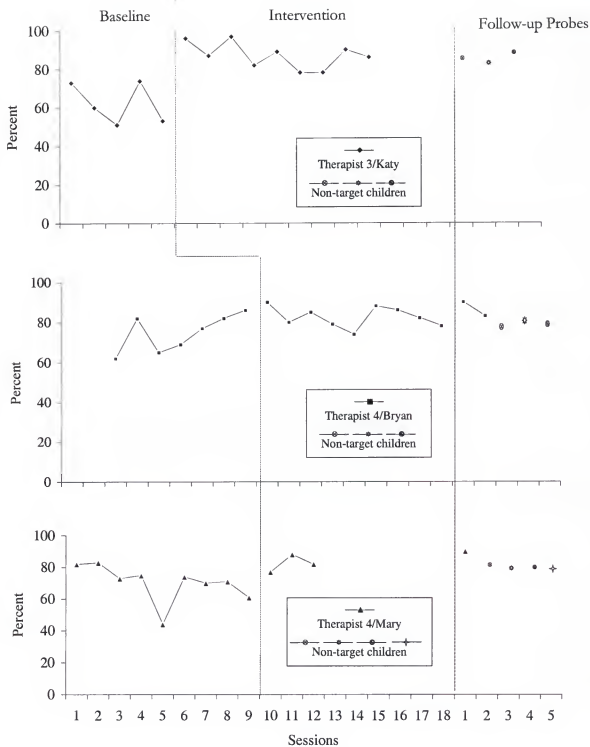


Figure 2: Percent occurrence of therapist direct commands--outpatient setting

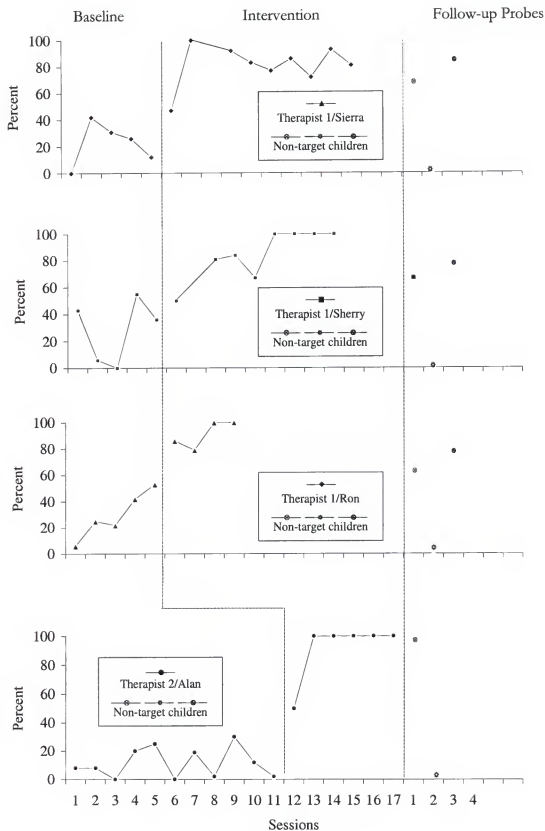


Figure 3: Percent occurrence of ignoring inappropriate child behavior--outpatient setting

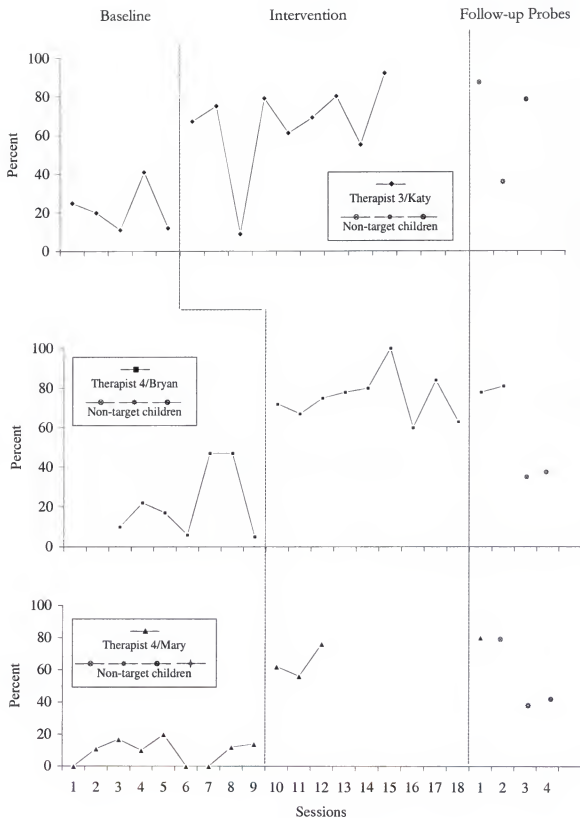


Figure 4: Percent occurrence of ignoring inappropriate child behavior--outpatient setting

during the intervention. During baseline, very little inappropriate behavior was ignored ($M = 20\%$; range = 9% - 30%). The goal for this category was to ignore 75 percent of all inappropriate child behavior.

During the intervention, there was a dramatic increase by all therapists to an average rate of 78 percent (range = 65% - 91%). Therapists in the inpatient setting attained an average increase of 62 percent while the therapists in the outpatient setting attained an average increase of 53 percent. The average percent occurrence for this behavioral category at baseline and during the intervention for all therapists is shown in Table 3. Although all therapists demonstrated significant increases in ignoring inappropriate behaviors, the average percentage of two of the therapists from the outpatient setting did not meet the goal level with two of the children (Therapist 3 (T3)/Katy = 65%, & T4/Mary = 65%). Therapist 1 exhibited an obvious upward trend during baseline with Ron, which continued during the intervention and was stable during the last two sessions at 100 percent. Therapist 1 also exhibited a subtle upward trend with Sherry and Sierra. However, following the intervention, the mean shifts between baseline and intervention were more obvious for Sherry and Sierra.

Attention to appropriate child behavior. Figures 5 and 6 show the total attention to appropriate child behavior, a combination of both attention and praise. The percent occurrence of attention to appropriate child behavior was calculated by dividing the total amount of attention to appropriate behavior (A+ and Praise) by the total amount of attention to both appropriate and inappropriate behaviors. During baseline, all therapists demonstrated high levels of attention to appropriate child behavior. Attention to appropriate child behavior was more variable during baseline, whereas during the intervention, the rates of attention were higher and more stable.

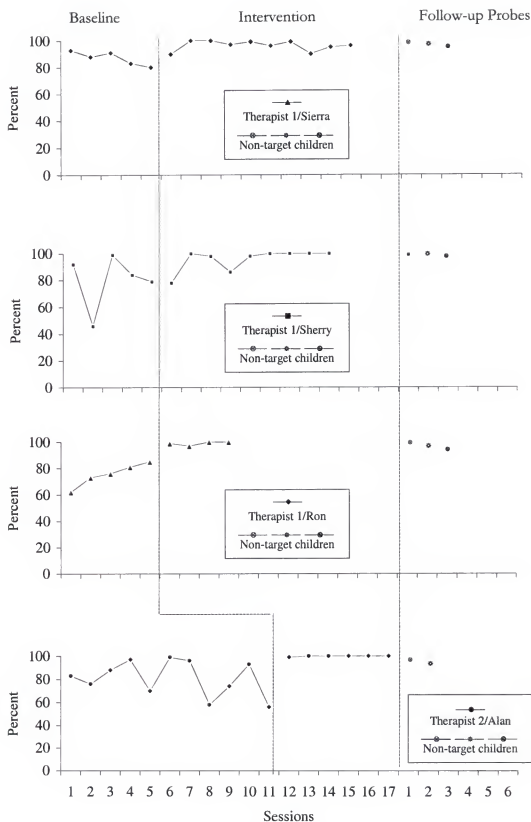


Figure 5: Percent occurrence of therapist attention to appropriate child behavior--inpatient setting

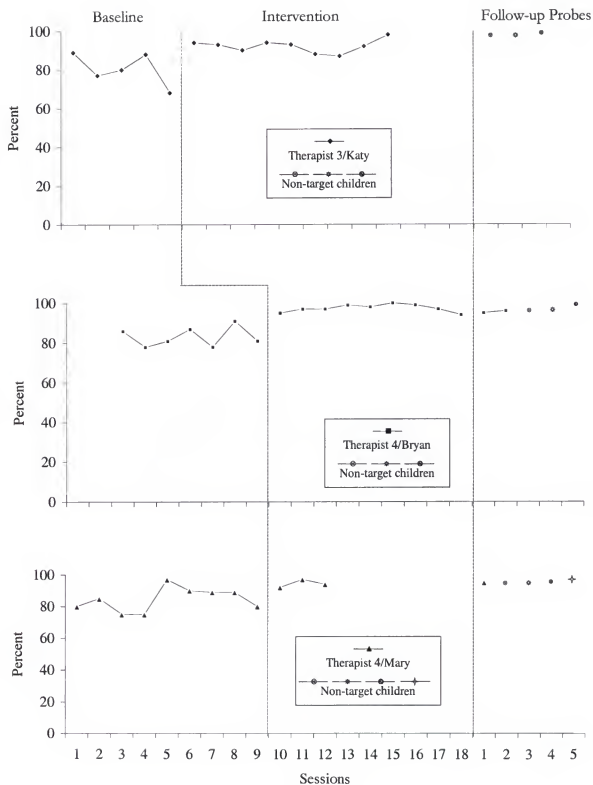


Figure 6: Percent occurrence of therapist attention to appropriate child behavior--outpatient setting

Therapists in the inpatient setting had an average increase of 17 percent during the intervention, while therapists in the outpatient setting had an average increase of 12 percent. The mean occurrence of attention to appropriate behavior across all child/therapist dyads at baseline and intervention are provided in Table 3. Therapist 1 demonstrated an obvious upward trend during baseline with Ron that increased further during the intervention. However, Therapist 1 did not exhibit the same trend with Sherry or Sierra. Therapist 4 also demonstrated a slight increase in this target behavior during baseline with Mary that increased further during the intervention.

Praise. Praise was defined as a separate and specific form of attention to appropriate child behavior. Praise was directed at child conduct not motor learning. The rates of praise per minute for each child/therapist dyad are depicted in Figures 7 and 8. As predicted, all four therapists demonstrated low levels of praise during baseline. Only after the implementation of the intervention did all therapists show substantial improvements in providing praise. The mean rates of praises per minute for all therapists at preintervention and intervention are shown in Table 3. Before the intervention, therapists provided an average of 1 praise per minute (range = .42 - 2.1). During the intervention, there was an increase by all therapists to an average rate of 2.4 praises per minute (range = 1.8 - 3.8). The decline in the rate of praise for Therapist 1, with Ron, is likely the result of the increased independence Ron exhibited in completing his exercises prior to discharge. Ron's increasing independence with his treatment program resulted in decreased interactions with his therapist.

Child Behaviors

Compliance. As a result of the therapists' training, it was hypothesized that child compliance rates would increase and inappropriate child behaviors would decrease. The percent occurrence of compliance across each therapist/child dyad is shown in Figures 9 and 10.

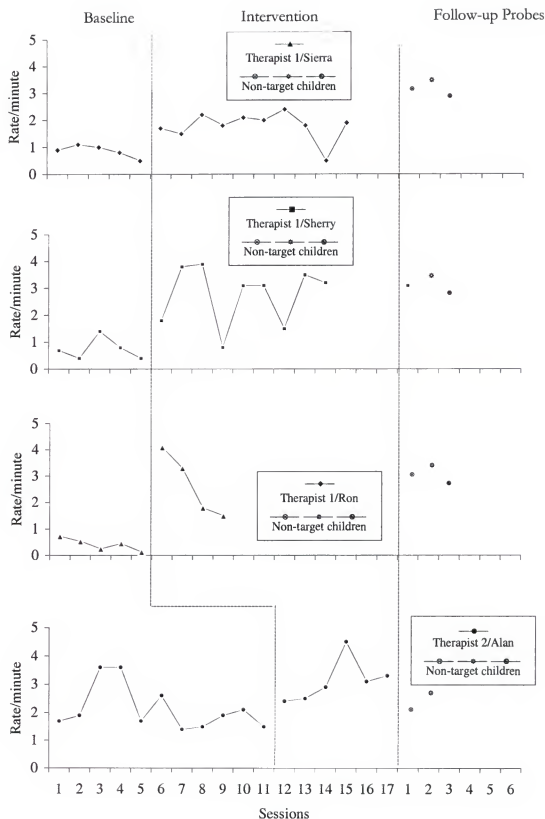


Figure 7: Rate of therapist praise to child--inpatient setting

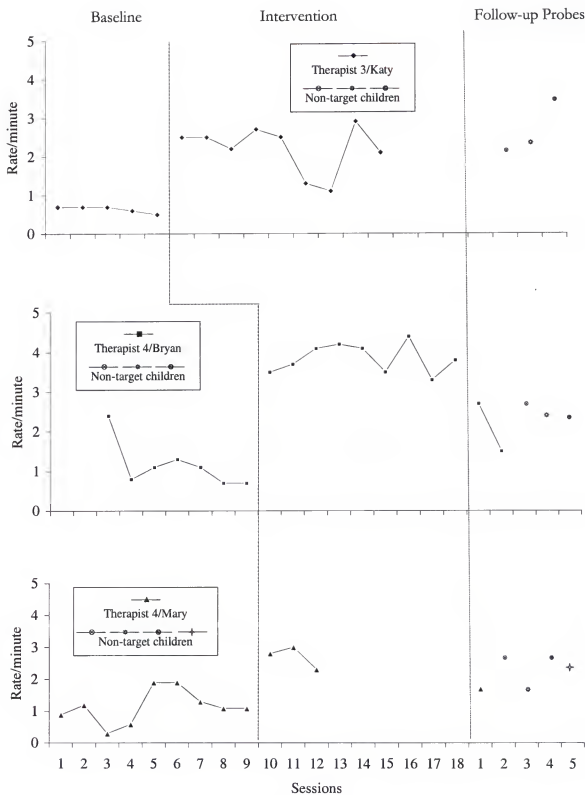


Figure 8: Rate of therapist praise to child--outpatient setting

The percent of commands complied with was calculated by dividing the number of commands complied with by the total number of commands followed by compliance plus noncompliance. Thus commands with no opportunity to comply were not included. There was variability for all of the children during baseline and the intervention, ranging as much as 35 percent between sessions. Although the rates of compliance were relatively high to begin with, during the intervention, 5 of the 7 children improved their rates of compliance further. However, of the remaining two, one child (Sierra) had a small decrease in compliance and another child (Sherry) had no mean change overall. Two children (Mary & Sherry) had an upward trend during baseline that confounded the improvements seen during the intervention. The average percent occurrence of compliance for both baseline and intervention across all children is shown in Table 3.

Noncompliance. Figures 11 and 12 show the percent occurrence for child noncompliance with therapist commands. Rates of noncompliance were calculated by dividing the frequency of noncompliance by the total number of commands given with opportunities to comply. During the intervention, five of the children (Ron, Alan, Katy, Bryan and Mary), exhibited declines in their rates of noncompliance. Although one of the graphs (Sherry) indicated a downward trend in noncompliance, the two spikes in noncompliance during sessions 6 and 9 resulted in no change in the mean rate of noncompliance overall. Another child's rate of noncompliance (Sierra) declined throughout the intervention, however her mean rate of noncompliance across all sessions increased from a baseline rate of 7 percent to 15 percent during the intervention.

Inappropriate child behaviors. Figures 13 and 14 show the rates of inappropriate child behavior per minute across all therapist/child dyads. There was tremendous variability in the frequency of inappropriate child behaviors across sessions during both baseline and

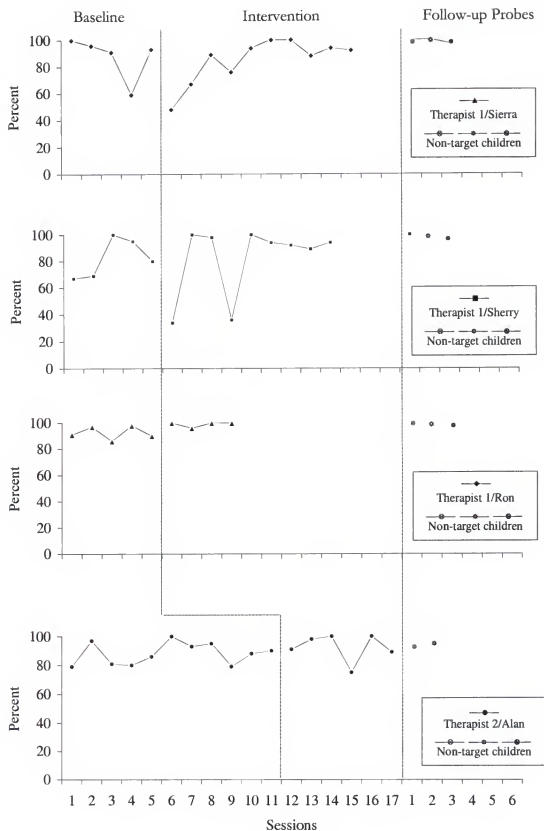


Figure 9: Percent occurrence of child compliance--inpatient setting

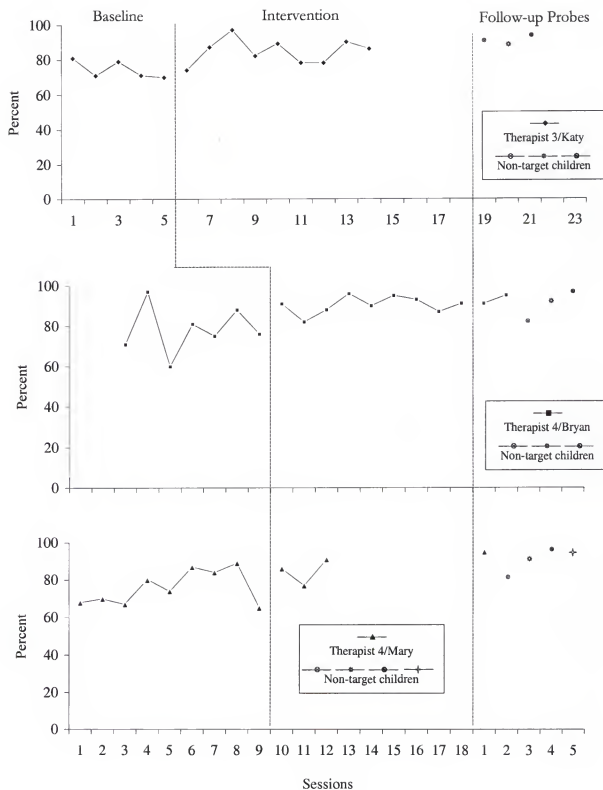


Figure 10: Percent occurrence of child compliance--outpatient setting

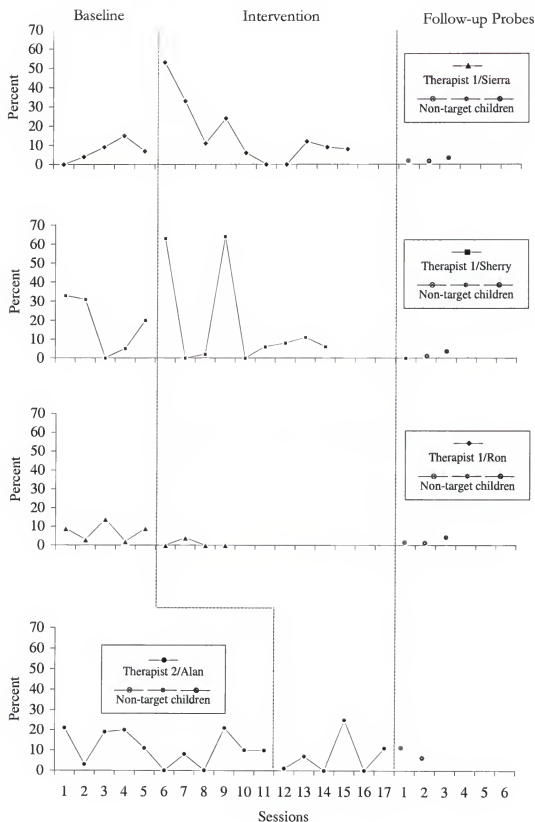


Figure 11: Percent occurrence of child noncompliance--inpatient setting

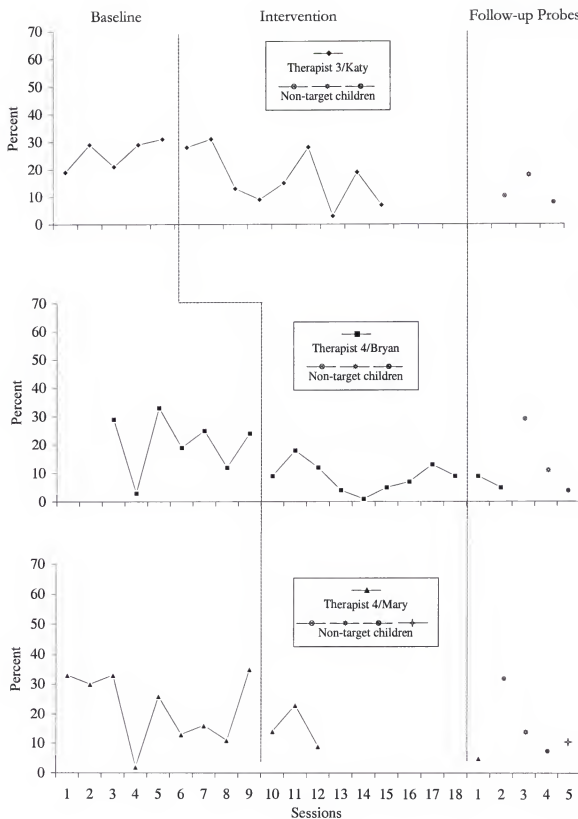


Figure 12: Percent occurrence of child noncompliance--outpatient setting

the intervention for six of the seven children. On average, the frequency of inappropriate behaviors across all children during the intervention decreased from 1.4 per minute (range = 1 - 1.7) to 1 per minute (range = .2 - 1.7) (see Table 3). However, for two children (Katy, and Mary), the average rate of inappropriate behaviors during the intervention increased. The average decrease in inappropriate behavior was greater than the average increase. Specifically, for the two children whose rates of inappropriate behavior increased, the average increase in frequency was .2 inappropriate behaviors per minute (range = .1 - .3) while the average decrease in the frequency of inappropriate behaviors per session for the four other children was .8 (range = .5 - 1.1). For one of the children (Alan), there was a very large and stable reduction in the occurrence of inappropriate behavior. Katy, on the other hand, demonstrated an increase in inappropriate behavior. The increases in her inappropriate behavior appear to be an extinction burst directly related to increases in the frequency of ignoring inappropriate behaviors by her therapist. Mary also demonstrated a tendency towards increasing inappropriate behaviors; however, the limited data points for Mary during the intervention preclude making strong conclusions about her behavior. Sierra's inappropriate behavior showed an increase during baseline with an upward trend during the intervention, although the mean rate of inappropriate behaviors did not change. Ron demonstrated a downward trend during baseline that continued during the intervention; however, his awareness of his impending discharge may have contributed to the decrease in his inappropriate behavior.

Follow-up. Follow-up was conducted to determine if the behavior management skills the therapists learned in the intervention would generalize to non-target children. Follow-up data for therapist target behavior are shown in Figures 1-8. Mean occurrence of target behavior is found in Table 3. Follow-up data for therapist target behaviors indicate that the majority of

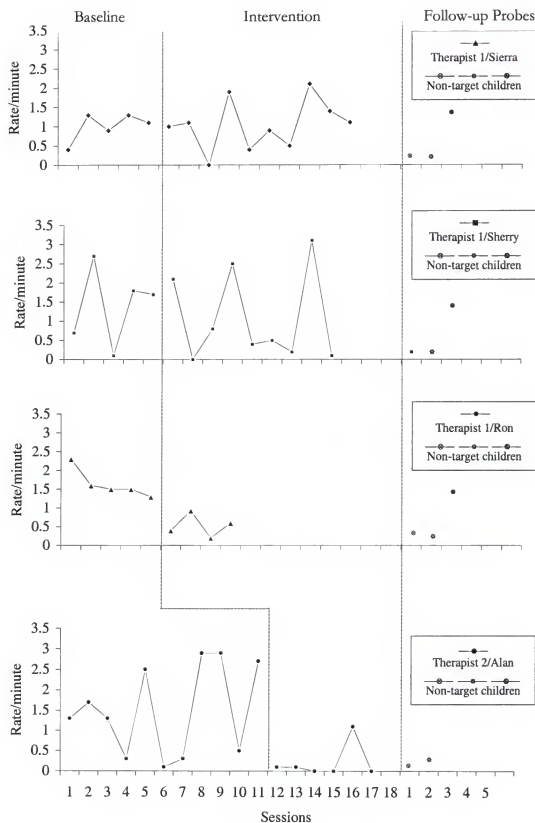


Figure 13: Rate of inappropriate child behavior--inpatient setting

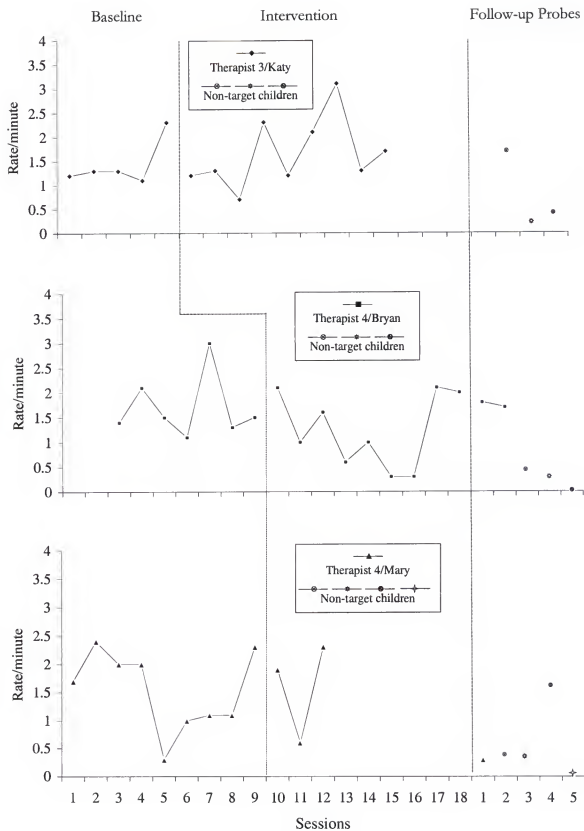


Figure 14: Rate of inappropriate child behavior--outpatient setting

the skills learned from the intervention were generalized to non-targeted children postintervention. Specifically, direct commands, praise and attention to appropriate behaviors remained at or above the criterion level. During the follow-up sessions, the levels of praise decreased somewhat for most therapists but still remained well above the baseline level. The frequency of praises per minute decreased during follow-up for Therapist 4 and Therapist 2 but increased further for Therapist 1 and Therapist 3. All therapists' follow-up levels of praise remained well above their baseline levels. The percent occurrence for direct commands fell during follow-up sessions for Therapist 1 when compared with the rates of direct commands with all three target children. However, the average rate of direct commands remained well above Therapist 1's baseline level achieved with Sherry and Sierra. The rate of direct commands also fell during follow-up sessions with Therapist 2, but again the follow-up level remained well above the average achieved at baseline.

Attention to appropriate child behavior remained high and stable for all therapists. The ability to ignore inappropriate child behaviors fluctuated among the therapists. Although the average rate of ignoring remained higher than the baseline levels, it fell for all therapists. This may have been due to the very low rate of inappropriate behaviors exhibited by the follow-up participants (1-2 inappropriate behaviors per session).

Comparisons between settings. Table 4 shows the average change on several behavior categories for therapists and children in both settings. Overall, the therapists made positive changes in the target behaviors in both settings. As a result of the therapists' changes, the majority of child behaviors also improved. However, the degree of change of behavior varied in each setting. Therapists in the outpatient setting had lower rates of ignoring inappropriate child behavior compared to therapists in the inpatient setting. On other target behaviors, they attained very similar rates of behavior although they may have

Table 4

Average change in the inpatient setting vs. outpatient setting.

Behavior Category	Average change - inpatient setting	Average change - outpatient setting
Direct commands	27% increase	15% increase
Child compliance	3% increase	11% increase
Child noncompliance	0	10% decrease
Commands with no opportunity for compliance	17% decrease	15% decrease
Praise	1.5/minute increase	1.9/minute increase
Attention to appropriate child behavior	.3/minute decrease	.4/per minute increase
Inappropriate child behavior	.7/minute decrease	0
Inappropriate child behavior followed by ignore	62% increase	52% increase

started at different levels at baseline. For example, therapists in the inpatient setting made a 27 percent increase in their direct commands across all children; however, this group of therapists started with a rate of direct commands 14 percent lower than that of the outpatient therapists. Overall, both groups attained a similar average rate of direct commands (see Table 5).

Children in the outpatient setting had a larger increase in compliance (11%) compared to the children in the inpatient setting (3%). However, children in the outpatient setting started with a 10 percent lower rate of compliance in the inpatient setting. Yet both groups reached a similar level of compliance during the intervention phase. Additionally,

Table 5. Average rate of occurrence for target behavior at pre- and post-intervention and across settings

Behavior Category	Inpatient Setting		Outpatient Setting	
	Pre-intervention	Post-intervention	Pre-intervention	Post-intervention
Direct command	56%	83%	70%	84%
Compliance	86%	89%	76%	87%
Noncompliance	11%	11%	24%	14%
No opportunity for compliance	55%	38%	55%	40%
Praise	1.0/min	2.5/min	.98/min	2.9/min
Inappropriate child behavior	1.4/min	.7/min	1.5/min	1.5/min
All attention to appropriate child behavior	81%	98%	82%	94%
Inappropriate child behavior followed by ignore	23%	85%	16%	68%

children in the outpatient setting had a larger decrease in noncompliance (10%), whereas setting experienced no change, on average, in rates of noncompliance. However, once again, children in the outpatient setting had higher rates of noncompliance during baseline (24%) than children in the inpatient setting (11%).

Consumer Satisfaction

On the measure of consumer satisfaction (see Appendix B), it was predicted that the therapists receiving SIT would rate the training as acceptable, effective and beneficial in reducing behaviors problems and increasing compliance in children during physical therapy. Table 6 shows the mean scores on the satisfaction questionnaire. Overall, the items on the questionnaire were responded to positively except the time commitment needed for the study was on average rated as "a little long". Additionally, one therapist rated the behavior

of one child as “somewhat worse” (Therapist 1/Sierra). Two therapists commented that the most helpful aspects of the training included “learning to reinforce positive behavior and to ignore negative behavior”, another therapist reported that “definite guidelines to follow when there was a compliance problem” was most helpful. When asked to describe the least helpful aspects of the training, one therapist reported “nothing really”. Another therapist reported that “time out just did not fit in this setting, nor did time out or a physical guide work with all kids or all ages.” Two therapists made no suggestions for improvement.

Table 6

Mean scores on Consumer Satisfaction Questionnaire.

Item	Mean	Range
1. Rationale for the training	4.75	(4-5)
2. Relevance of training to work	4.25	(4-5)
3. Learning techniques for dealing with behavior	4.25	(4-5)
4. Time commitment needed for the training	2.00	(1-3)
5. Acceptability of techniques	4.25	(3-5)
6. Child's behavior following training	4.14	(2-5)
7. Child's compliance following training	4.43	(4-5)
8. Changes observed in non-target children	4.50	(4-5)
9. Intervention facilitated more productive PT	4.50	(4-5)
10. Overall rating of training (10-point scale)	8.25	(7-9)

DISCUSSION

This study sought to determine if physical therapists could learn general behavior analysis and therapy skills using an intervention program that incorporated a modeling videotape, individual interaction training, feedback and reinforcement. An additional purpose of this study was to determine if the physical therapist's use of behavior analysis and therapy would result in decreased levels of inappropriate child behaviors and increased levels of compliance during PT. A multiple baseline design was used with two therapists and four children in an inpatient children's hospital, and two therapists and three children in an outpatient PT setting.

Results indicated that after participating in Strategic Interaction Training (SIT), the physical therapists learned the behavior analysis and therapy skills and incorporated them into their daily PT sessions and, that the changes in their behavior were the result of the intervention. Specifically, following the intervention, therapists increased their levels of direct commands, ignoring inappropriate child behavior, attention to appropriate child behavior, and praise. As a result, compliance increased, and noncompliance and inappropriate behaviors decreased for most children. Results also indicated differences in the amount of change in target behaviors between participants in the inpatient setting and the outpatient setting. The intervention was rated positively by the therapists.

Ignoring inappropriate child behavior seemed to be the most difficult behavior change for therapists to make. Two therapists did not reach the goal level during the intervention, and the rates for this behavior fell during follow-up for all therapists. One

possibility for this finding is that the goal level was too high. However, it is worth noting that the average percent occurrence of inappropriate child behaviors increased for the two children whose therapists did not reach the goal level set for ignoring inappropriate child behaviors. It seems likely that the intermittent reinforcement in the form of therapist attention to the inappropriate behaviors contributed to the increase in inappropriate child behaviors. The children whose therapist's average percent of change in ignoring inappropriate behavior was highest, and thus had a more consistent rate of ignoring, had the greatest decrease in inappropriate behaviors. Katy appeared to experience an extinction burst for her inappropriate behaviors. During sessions when the rate of therapist ignoring was high, the rate of child inappropriate behaviors was also high. When the rate of therapist ignoring was low, the rates of inappropriate child behavior were also low. Thus, it may be that for this dyad, the therapist was punished with an increase in inappropriate child behaviors when she ignored more consistently.

During the intervention, therapists were coached and given feedback to provide a high level of target behaviors. Following the intervention, the rates of some therapist target behaviors, such as direct commands, ignoring inappropriate child behavior, and praise, fell for most therapists. Follow-up sessions were conducted at least one month post-intervention. During that time, it is likely that therapists assumed a more natural rate of target behaviors. Whereas a more consistent rate of ignoring would be best for extinguishing inappropriate child behaviors, an intermittent rate of positive reinforcement in the form of praise would have a better effect on the maintenance of appropriate child behaviors.

Five of the seven children demonstrated an increase in compliance to therapist commands following the intervention. Only one child had a decrease in compliance and one child's rate of compliance stayed the same. It is difficult to determine cause and effect for changes in a particular behavior when an intervention targets multiple behaviors, and several factors may have influenced the positive changes in compliance rates. First, all therapists made increases in the rates of direct commands. Direct commands tell the child specifically and clearly what to do versus indirect commands that may inadvertently present a command as if the child had a choice about complying. Second, the increase in compliance to commands may be the result of a decrease in rates of commands given with no opportunity to comply. It seems probable that eliminating multiple commands for the same behavior, and allowing the child time to comply, would result in the increased compliance rates.

On the consumer satisfaction questionnaire or in comments made to the experimenter, all therapists commented on the use of time out being difficult to utilize due to time constraints or the inability to enforce time out through the use of a restraint process. Although time out has been used extensively and effectively with children with developmental disabilities and behavior problems (Olmi, Sevier, & Nastasi, 1997), the use of time out may not have been appropriate for these settings because of the issues of time and restraint. Handen, Parrish, McClung, Kerwin, and Evans (1992) found time out to be more effective in promoting compliance in children with mild developmental delays when compared to a physical guide. A physical guide is often perceived as less aversive, easier to administer, and does not negatively reinforce the child by allowing the child to escape from a difficult situation (Handen et al., 1992). The physical guide was viewed differently by different therapists in this study. One therapist, who only used physical guides and not time

out, commented that she liked having definite guidelines to follow when there was a compliance problem. Another therapist reported that the physical guide did not seem to work with older children.

Differences Between Settings

Differences between the settings included the outpatient setting being a more structured setting where therapists had sequential appointments throughout the day with very little flexibility in their schedules. This had implications for the amount of feedback they received as well as the format in which they received their feedback. Because the therapist usually had another child waiting for the next appointment, these therapists frequently did not have time immediately following a session with a target child to receive and discuss the feedback. As a result, the researcher had to provide feedback in different formats such as via telephone and written feedback via fax. Therapists in the inpatient setting had a great deal more flexibility in their schedules and were available to receive and discuss verbal feedback following each session with the target children.

Another aspect of the research that was different between the settings was the length of the relationship each therapist/child dyad had prior to their involvement in the study. Children in the outpatient setting had been working with their therapists, for over 1-2 years. Their behavioral repertoires were strongly engrained and perhaps more resistant to change. These lengthy relationships may account for the higher rates of noncompliance and lower rates of compliance seen during baseline. In the inpatient setting, the children had been working with their therapists for only 1-2 months. These relationships were still forming and the therapists may have been more lenient, using more indirect commands versus direct commands, and the children may have been more eager to please, possibly contributing to the higher rates of compliance seen during baseline.

Another aspect of the research that was different between settings was the presence of a research assistant or the primary investigator. During the inpatient intervention, the primary investigator (PI) provided all coaching and feedback during the training and intervention, with a research assistant observing. Due to significant time constraints, the PI was not always able to provide the coaching and feedback directly to the outpatient therapists. Instead, the PI frequently informed the research assistant as to what behaviors to coach a therapist in during Phase 2 of the intervention and what feedback to give during Phase 3. The PI did conduct Phase 1 of the intervention with all therapists.

Additionally, the environment the children were in when not participating in PT and the frequency of PT with the target children differed between the two PT settings. In the inpatient setting, children were patients in the hospital for many weeks, away from their families, schools, and homes. The hospital was the environment in which they were residing. Additionally, these children were hospitalized for rehabilitative purposes and they received PT every day. On the other hand, children being seen in the outpatient setting were living in their own homes with their families, going to their own school every day and coming to the PT setting for their therapy. These children had different needs for therapy and were seen once, twice, or at most, three times a week. These children could also miss their therapy and frequently did. These variations between the settings may have impacted the rates of change in various behaviors. In spite of the fact that there were several key differences between the settings, all therapists involved in the study demonstrated positive changes on target behaviors. This lends support for the generalizability of the intervention across different settings and therapy formats.

Strengths and Weaknesses of the Study

Strengths of this study include conducting the study in multiple settings.

Additionally, the variety of children, with varying diagnoses and behavior problems indicate the generalizability of this intervention in promoting positive changes in both children and therapist's behaviors. Incorporating follow-up sessions that occurred at least one month postintervention with primarily different, non-target children, further demonstrated the generalization of the intervention as well as the maintenance of the skills learned.

An additional strength of the study is the involvement of several therapists. Few studies have involved therapists in the intervention, and then it has only been one therapist that has been involved. This study is the first study to train multiple therapists in behavior analysis and therapy.

Weaknesses of the study include differences in the implementation of various components of the study. The greater use of the research assistant in the outpatient setting may have accounted for some of the differences in the outcome. However, this also speaks to the likelihood that such training could be conducted by less well-trained personnel, on a less frequent basis, perhaps resulting in a more cost-efficient intervention.

Additionally, although this study had more therapists involved in the intervention than any previous study, 4 therapists and 7 children is still a small sample size. A further weakness is that two children left the study prematurely during the intervention. In the inpatient setting, Ron was told he would be going home just prior to implementing the intervention with his therapist. This information may have had a positive impact on his behavior above and beyond that of the intervention. In the outpatient setting, Mary left for a six-week vacation with her family and thus we were only able to obtain three intervention data points.

The use of a multiple baseline design has both strengths and weaknesses. For the purposes of this study, a new intervention, it allows for a detailed analysis of both PT and child behavior. It also allows for ongoing assessment of the intervention as well as refinement and change in the intervention depending on the data. However, while there are certain guidelines used with graphic analysis, the reader's interpretations of the findings may be influenced by their own experiences and views regarding the procedures, meaning, and importance of the research (Parsonson & Baer, 1992). Additionally, there are concerns regarding external validity, and the generalizability of the findings outside the sample. Replication of the results in future studies can increase the confidence of these findings.

Implications

This study is an important contribution to both fields of physical therapy and psychology. It describes an effective training intervention that psychologists can use to help physical therapists learn behavior analysis and therapy skills to enhance productive physical therapy. It is the first study to train multiple physical therapists on the use of general behavior management skills that can be applied with many children with a variety of behavior problems. Such techniques will allow the therapist to work more autonomously and deal more effectively with children who present with difficult behavior.

Few studies have incorporated training the physical therapists to use a behavioral intervention in the PT setting. The majority of studies have typically involved a behavior specialist to conduct the intervention, leaving the therapist dependent on a behavior specialist each time they encounter a difficult child whose behaviors interfere with PT. This study extends the current literature by demonstrating that physical therapists can learn behavior management skills and effectively implement these skills into their PT sessions.

Additionally, this study demonstrated the effectiveness of the intervention in two very diverse PT settings, inpatient and outpatient, which demonstrates the generalizability of the findings.

This study has further implications for the future of collaborative efforts between physical therapy and psychology. Overt, disruptive behavior in children is but one aspect in which psychologists could help facilitate improved physical therapy. Other problem behaviors can consist of depression, anxiety, fear, chronic pain, noncompliance, coping with loss (of limb or function), and death and dying issues. Through better integration of mind and body functioning through increased collaborations between PTs and psychologists, it is likely that PTs can further enhance the effectiveness of their interventions with both children and adults facing a myriad of health problems.

Future Directions

This study clearly demonstrates that Strategic Interaction Training resulted in positive changes in the therapist's behaviors, and positive changes in the majority of target child behaviors. However, noncompliance and inappropriate child behaviors that were disruptive to the treatment process still occurred during PT. Having the ability to identify specific variables maintaining noncompliance and problem behaviors would likely enhance a therapist's ability to further impact the occurrence of these problems. Recently, researchers have been training other professionals such as teachers, and parents to conduct their own functional analyses in the classroom or at home and to generate hypotheses of the functional relationships of the aberrant behaviors being exhibited (Foster-Johnson & Dunlap, 1993; Frea, Koegel, & Koegel, 1993).

Boggs, Danforth, & Stokes (1986) demonstrated that mothers of children with attention deficit hyperactivity disorder could learn to provide contingent rewarding, clear

instructions, and positive attention to their child and that as a result, child compliance rates increased and inappropriate child behaviors decreased. However, untreated child behaviors were not affected until the parents were trained to analyze functionally their child's behavior.

Therapists in this study were not trained in a manner that would promote generalization (Stokes & Baer, 1977). Having learned basic behavioral techniques during SIT, the ability to analyze functionally child problem behavior would have allowed therapists to apply more readily the principles and techniques learned during SIT to new behaviors exhibited by other non-target children during therapy. Such training would be more consistent with generalization programming promoted by Stokes and Osnes, 1989. The better equipped the therapist is to assess the functional contingencies of behavior, and utilize that information, the more likely that treatment techniques will be effective.

This seems a logical next step in training other professionals in behavior analysis and therapy. In this study, although positive changes were evident for the majority of target behaviors, individualized approaches for some of the children would likely have resulted in greater behavior changes. For example, Sherry had both legs immobilized for six weeks in long leg casts following her surgery. During her admission for rehabilitation, she demonstrated extreme anxiety about bending her knees. Her inappropriate behaviors, including aggression, noncompliance and screaming, escalated during activities that focused on bending her knees. An individualized approach could incorporate relaxation training exercises such as deep breathing, imagery, and positive self-talk, outside of the PT setting to provide her with better coping skills during PT. However, not only have physical therapists not received training in behavioral techniques to deal with problem behavior, they also rarely receive training in integrating cognitive-behavioral techniques such as relaxation training into their therapy.

Had the therapist been able to conduct a functional analysis for Sierra, it likely would have demonstrated that many of Sierra's most difficult behavior problems escalated when she was asked to perform a particular exercise that was more painful than the others. In this situation, if the therapist followed Sierra's noncompliance with a time out, her behavior was reinforced with escape from the difficult and painful exercise. Again, an individualized approach could have incorporated additional techniques such as relaxation training and teaching Sierra different ways to perform the exercise independently, thus providing her more self-control during difficult exercises.

Physical therapists frequently conduct exercises that are painful for their patients. Many patients may experience fear or anxiety during PT because of the discomfort they experience. Physical therapist would benefit from knowing how to utilize cognitive-behavioral techniques such as relaxation training, deep breathing, and imagery. The integration of psychological interventions with physical interventions can only serve to further enhance the effectiveness of therapy, decrease some of the aversiveness of therapy, and empower patients by encouraging them to take more control over their pain, anxiety and fears. Health and pediatric psychologists could be instrumental in promoting this training and providing ongoing consultation for such issues.

Parent training is the most commonly implemented behavior management program. It has been well-established that a group format can be equally if not more effective than individual training (Eyberg & Matarazzo, 1980; Webster-Stratton, 1990). The format used for Strategic Interaction Training could easily be adapted for use in a group format for future use. This format would have the advantages of sharing problems and intervention ideas among therapists and be a more efficient use of both the psychologist's and therapist's time. Additionally, child behavior problems are certainly not limited to the PT setting.

Occupational therapists, speech therapist, nurses, and doctors, as well as the child's parents, could all potentially benefit from similar training in behavior management techniques. Training multiple exemplars outside of the PT setting would allow for generalization of child's improved behavior outside of the PT setting as well (Stokes & Baer, 1977). Because consistency is so important in effecting change in children's behavior, it seems likely that if a child's behavior is treated consistently by a variety of people he/she comes into contact with, it would result in further reductions in inappropriate and noncompliance behaviors.

Finally, now that it has been established that physical therapists can learn behavior therapy skills and effectively implement these skills, it will be meaningful to assess if PT was in fact more productive in terms of attaining PT goals in a more timely manner following a training intervention in behavior analysis and therapy. The benefit of such an intervention to decrease the number of PT sessions needed for some children and increase the effectiveness of PT should be assessed in future studies. Additionally, the cost effectiveness and cost offset of such an intervention needs to be evaluated. For children who do not receive PT due to severe behavior problems, or whose PT does not progress due to their problem behaviors, a behavioral intervention such as SIT would be clearly indicated, and yet is infrequently employed due to lack of knowledge by the therapist.

A future study to measure progress made towards PT goals is warranted. Such a study could take the form of an experimental design involving two groups of children receiving PT, who are matched with similar disabilities and PT goals, and exhibit significant disruptive behaviors that interfere with PT. The experimental group would receive PT from therapists who have received SIT, while the control group would continue to receive standard PT from untrained therapists. The number of sessions to reach the therapeutic goals would be the dependent variable.

Several single-subject designs have been conducted with children who were not progressing in therapy until a behavioral intervention was implemented (Horner, 1971; Chandler & Adams, 1972). These studies lend support to the efficacy of a behavioral intervention for children with behavior problems that impede progress in physical therapy. However, more controlled studies, with larger samples may need to be conducted to further promote the benefits of incorporating behavior analysis and therapy into the PT setting.

APPENDIX A
PROCEDURAL OUTLINE - SIT TEACHING SESSION

Before Session:

1. Set up room;
 - a) Put modeling videotape in VCR and set up television.
 - b) Have handouts on Behavioral Definitions, Key points about Ignoring, and time out.
 - c) Have video camera set up with tape and microphone turned on.

Treatment Session

1. **Provide overview of SIT.**

PHASE 1: Today we will talk about certain behaviors and behavioral definitions and watch a videotape of a physical therapist working with a child who has some behavior problems.

PHASE 2: Starting tomorrow, your PT sessions will be observed, coded, and videotaped with non-participating children. I will be coding different intervals in each session. I will also be helping to label target behaviors of the child, and provide prompting for you to use target the behaviors we discuss today. At the end of each session, we will review the data on your performance. Your goal is to make 75% of all praise and attention contingent upon appropriate behavior, ignore at least 75% of all negative behavior, and to make at least 75% of all requests for action direct commands.

PHASE 3: When the goals as stated above are met, PT will resume therapy with children from the baseline phase. Each session will be observed, coded, and videotaped. After each session, you will receive feedback on the target behaviors.

2. **Provide handout of behavioral definitions to therapist.** Review each definition and the examples provided before reviewing the tape. Attention will focus on the therapist's target behaviors noted from baseline.
3. **Commands should be direct rather than indirect.**
 - a) A direct command is a clearly stated order, demand, or direction in declarative form.
 - b) The statement must be sufficiently specific as to indicate the behavior that is expected from the child

- c) Give examples of “let’s”, “how about”, and “why don’t you” commands.

Examples: “Let’s do your leg lifts now.” “Can you walk now?” “Let’s transfer to the mat, OK?” “How about ten more?”

- Many indirect commands are expressed in question form.
- A direct command should leave no question in the child’s mind that he/she is being told to do something, no illusion of choice.
- You can still be polite and preface the command with “please”. Give examples of direct commands: “Transfer to the mat please.” “Please take five steps forward.”

4. _____ Commands should be positively stated.

- a) Tell the child what “to do” instead of what “not to do”.
- b) Try to avoid “don’t” commands. In many situations, it is possible to give a positively stated command that is incompatible with the negative behavior you are trying to eliminate (e.g., “Straighten your arm” instead of “Don’t bend your elbow.” Or “Put the toy down” instead of “Don’t throw that.”)

5. _____ Commands should be simple.

- a) Commands should be things that the child is capable of doing as much as possible. However, I realize that is difficult to always know what a child in PT is physically capable of doing, and that as a PT, you are frequently working to increase the child’s ability.

6. _____ Commands should be given one at a time.

- a) Children have a hard time remembering more than one thing at a time. Avoid stringing together commands (e.g., “Go transfer onto that mat, do 10 straight-leg-raises, 10 heel slides, and 10 short-arc-quads.” That’s a lot to ask a child to do all at once.
- b) Instead break that big command down into its smaller parts.
- c) Another problem in giving a big command is that the child has an awful lot of work to do before he/she gets positive feedback from you for complying. We will talk about compliance and praise in detail in a few minutes.

7. _____ Commands should not be vague.

- a) Make sure that your commands tell the child specifically what to do.
- b) Commands like “be careful”, “relax”, “be good”, “look” are so nonspecific that the child does not know exactly what to do in order to comply. Also, commands such as “Do your bridges” does not tell the child how many to do. Instead use commands like “Put both crutches on the floor please.” “Walk to the door please”, “Do ten bridges”.

8. _____ Indirect Commands - are orders, demands, or directions for a behavioral response that is implied, nonspecific, or stated in question form. This type of command implies that the child has a choice when often they do not. Provide examples. “Let’s

walk now", "You might want to sit down now", "How about we do your leg lifts first?", "Can you reach for the bean bag?"

9. — **Ask the therapist what he/she would do if the child complied with the therapists commands.**

-
-
- Instruct them to give the child a labeled praise contingent upon child compliance.
 - A praise is any specific or nonspecific verbalization that indicates liking, approval, or expresses a favorable judgment upon an activity, product, or attribute of the child.
 - Distinguish b/w labeled and unlabeled praise.
 - Give examples of praise in terms of compliance:
 - "You did a great job sitting up all by yourself" (labeled praise)
 - "I like how well you are walking today" (labeled praise)
 - "Thank you for transferring to the mat so quickly!" (labeled praise)
 - "Good job." "Way to go!" (unlabeled praise)

10. — **Ask the therapist to provide examples of appropriate behaviors that occur in PT. List the examples provided by the physical therapist:**

-
-
-
- Discuss how the therapist's attention (verbal, as in talking, or physical touch) should only be delivered as long as the child is behaving appropriately (e.g., as long as the child is doing his/her exercises, or the child is calm while being stretched, the PT can provide attention to him/her).
 - Emphasize how this is different from praise.
 - Encourage therapist not to talk following a command, until the command is complied with.
 - Discuss how this might interfere with learning new motor patterns, as well as just being distracting and interrupting, which may interfere with the child completing the command.

11. — **Ask the therapist to provide examples of negative behavior that occur in PT. List the examples the PT provides:**

- a) Reinterpret these as compliance, noncompliance, inappropriate behaviors, and escape techniques.
 - b) **List your response**/reinterpretation next to the example of negative behavior the PT provides.
 - c) The therapist will probably list many behaviors that are attention seeking behaviors or escape motivated behaviors. Identify these.
 - d) Inform therapist that all inappropriate behaviors are to be **IGNORED**.
 - e) Provide Ignoring handout.
- a) — **When you ignore negative behavior** you give no verbal or nonverbal reaction, and continue what you are doing, except for providing further talk other than to give commands.
- b) At first, when you ignore negative behavior, it may get worse.
 - c) But with **CONSISTENCY** on your part the inappropriate behavior will go away.
 - d) Be sure to be consistent in your ignoring or it will not work. Give example of child wanting candy in the grocery store. If you do not think you can consistently ignore a behavior, do not begin to ignore, or stop ignoring early rather than later.
 - e) As soon as the negative behavior ceases, provide attention and praise.
13. — **Discuss Compliance and Noncompliance.**
- a) If you give a command and the child is noncompliant, meaning he/she does not initiate the command in 5 seconds and complete the behavior without further prompting, you are to physically guide the child through the command or give the warning discussed below.
 - b) As long as the child is continuing to follow through with the command, regardless of inappropriate accompanying behavior such as crying, even after 5 seconds, it is compliance.
14. — **Discuss Time out vs. Physical Guide.**
- a) If the child is noncompliant after five seconds, you may physically guide the child through the motion, or command, showing no emotion and without comment. Then, immediately provide another simple direct command and praise the child if he/she complies or pause at least five seconds before providing attention to the child, and then provide attention only to appropriate behavior.
 - b) If the therapist opts for time out, instruct the therapist to give the following warning if the child disobeys: *"If you don'tyou're going to sit in time out."* **Do not repeat your command** or ask if he/she heard you. You need to use these exact words each time. Again, after the warning, you need to decide if the child is being noncompliant.
15. — **Ask the therapist what he/she would do if the child obeyed the warning.** Instruct the therapist to give a labeled praise.

16. — **Instruct the therapist in the time out procedure using the time out diagram.**
 - a) Place the child on the mat and say only *"You didn't do what I told you to do so you have to stay here on the mat."* Ask the therapist what he/she thinks the child will do at this point.
 - b) Discuss issues about time out, safety, mobility of the child, etc.
 - c) Discuss how to get the child to the mat quickly and safely, possibly carrying the child from behind.
 - d) Once the child is on the mat, the therapist is to say *"Now stay here until I tell you to get off."* The child has to stay in the room for exactly three minutes with five seconds of silence before the therapist can return.
17. — **Discuss the importance of using those exact words and nothing extra.** The words were chosen to be the shortest simplest way to tell the child the reason he/she is in time out and what he/she has to do now. The child gets no extra attention. Time out is effective only if the therapist is in control of when the child can leave time out.
18. — **When the child is in time out, what kinds of things could he/she do? Discuss these issues and how to handle them.** Basically, anything the child does is ignored unless the child's safety is at risk.
19. — **Define the following:**
 - a) **Inappropriate Behaviors** - includes crying, whining, or yelling, and smart talk. Crying consists of inarticulate utterances of distress (audible weeping) at or below the loudness of normal conversation. Whining consists of words uttered by the child in a slurring, nasal, high-pitched, falsetto voice. Yelling consists of a loud screech, scream, shout or loud crying. The sound must be loud enough so that it is clearly above the intensity of normal indoor conversation. Smart talk consists of is impudent or disrespectful speech.
 - b) **Aggression** - verbalization of threats, even if said in a joking tone of voice, and physical threats or behavior directed at (1) therapist, (2) self, or (3) environment.
 - c) **Pain behaviors** - grimacing, vocalized complaints of pain, such as yelling out, whining about pain.
20. — **Discuss Attention to Inappropriate Behavior.**
 - a) Attention to inappropriate behavior includes talking to the child, reacting by pulling away, or stopping an activity, providing physical touch, other than is therapeutically necessary, when the child is being noncompliant, crying/whining, dawdling, or being aggressive. This also includes negotiating, "threatening" the child, or allowing the child to escape from a demand situation, activity, or therapy.

Examples:

- Child is purposefully falling in the walker, and therapist says “Stand up!”
- Child is having a tantrum and the therapist tries to calm him/her by talking or touching, or allows the child a break. As soon as the child calms down, and complies, he/she can then have a break.
- Child is refusing to scoot back on the mat, and therapist continues to say “Scoot back!”

b.) Describe how attention to inappropriate behaviors increases the likelihood of increasing inappropriate behavior.

21. ____ Describe Information Descriptions and Behavioral Descriptions.

- a) Information descriptions introduce information about people, objects, events, or activities, but do not clearly describe the child’s current or immediately completed behavior.

Examples of Information Descriptions:

- “I can tell you have been doing your exercises”.
- “Tomorrow is Saturday.”
- “I’m going to work on your legs first.”
- “Your legs feel tight today”.
- “This is the last set”.

- b) Behavioral Descriptions are statements used to describe the child and a verb describes the child’s ongoing or immediately completed verbal or nonverbal observable behavior.

Examples of Behavioral Descriptions:

- “You’re transferring to the mat.”
- “I see you’re trying hard to lift that leg.”
- “You’re pushing your wheelchair.”

22. ____ Review videotape.

- a) Point out examples of praise, direct commands, ignoring negative or inappropriate behaviors, and attention to appropriate behaviors.

23. ____ Answer any questions. Write down what questions are asked.

24.____ **Review basic rules of behavior modification.**

- a) Ignore all negative behaviors.
- b) Review “Key Points About Ignoring” handout.
- c) Provide positive reinforcement contingent upon positive behavior.
- d) Use direct commands to increase compliance with requests for action.
- e) Use a lot of praise following compliance for commands.
- f) Consistency is key!!!

APPENDIX B

DEMOGRAPHICS QUESTIONNAIRE

Participants Initials: _____ Subject # _____ Date: _____

Age: _____ Gender: _____

Diagnoses: _____

Brief medical history: _____

Goals for physical therapy: _____

Physical Therapists initials: _____ Highest degree obtained: _____

Number of years practicing PT: _____ NDT Training? Yes No

Number of years working with children: _____

Number of years at Shriner's: _____

APPENDIX C
CONSUMER SATISFACTION QUESTIONNAIRE

Please circle the response for each question that best expresses how you honestly feel.

1. Regarding the goals/rationale for the training, I feel that they were:

- | | | | | |
|---------------|------------------|--------------------|----------------|------------------------|
| 1. not stated | 2. poorly stated | 3. stated somewhat | 4. stated well | 5. stated very clearly |
|---------------|------------------|--------------------|----------------|------------------------|

2. Regarding the relevance of the training to my work, I feel that the goals for the training were:

- | | | | | |
|------------------------|----------------------|----------------------|------------------|-----------------------|
| 1. not at all relevant | 2. a little relevant | 3. somewhat relevant | 4. very relevant | 5. extremely relevant |
|------------------------|----------------------|----------------------|------------------|-----------------------|

3. Regarding the techniques for dealing with negative behavior of children in PT, I feel I have learned:

- | | | | | |
|------------|---------------------------|---------------------|------------------------------|---------------------------|
| 1. nothing | 2. very little techniques | 3. a few techniques | 4. several useful techniques | 5. many useful techniques |
|------------|---------------------------|---------------------|------------------------------|---------------------------|

4. Regarding the time commitment needed for the training, I feel it was:

- | | | | | |
|-------------|------------------|---------------|----------|---------------------------------|
| 1. too long | 2. a little long | 3. just right | 4. short | 5. very short (would like more) |
|-------------|------------------|---------------|----------|---------------------------------|

5. How acceptable are the techniques you learned in the training to you?

- | | | | | |
|--------------------------|------------------------|------------|---------------|--------------------|
| 1. not at all acceptable | 2. somewhat acceptable | 3. neutral | 4. acceptable | 5. very acceptable |
|--------------------------|------------------------|------------|---------------|--------------------|

Please describe:

6. After the training, how would you describe the patient's behavior

- | | | | | |
|-----------------------|-------------------|-------------|----------------------|---------------------|
| 1. considerably worse | 2. somewhat worse | 3. the same | 4. somewhat improved | 5. greatly improved |
|-----------------------|-------------------|-------------|----------------------|---------------------|

7. After the training, I felt that my patient's compliance to my commands or requests was:

1. considerably worse 2. somewhat worse 3. the same 4. somewhat improved 5. greatly improved

8. How would you describe any behavior changes in the children you work with as a result of the techniques you learned?

1. much worse than before 2. somewhat worse than before 3. the same 4. somewhat improved 5. greatly improved

9. How much do you feel that the techniques you learned helped facilitate more productive physical therapy with the children you worked with?

1. not at all 2. very little 3. no change 4. somewhat helpful 5. very helpful

10. Overall, how would you rate the training you have received to deal with negative behavior in physical therapy?

- | | | | | | | | | | |
|--------------------|---|---|---|---------|---|---|---|-------------------|----|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| not at all helpful | | | | helpful | | | | extremely helpful | |

11. What aspect of the training do you feel was most helpful?

12. What aspect of the training was least helpful?

13. Please provide any feedback you feel would be helpful enhance the Strategic Interaction Training program

APPENDIX D BEHAVIORAL DEFINITIONS

Direct command - is a clearly stated order, demand, or direction in declarative form. The statement must be sufficiently specific as to indicate the behavior that is expected from the child. Commands should be direct vs. indirect, positively stated, simple, concise, and given one at a time.

Examples:

- "Lift your leg up."
- "Transfer to the mat."
- "Do ten more leg lifts please."
- "Take five steps forward please."
- "Walk to the door please."

Indirect command - is an order, demand, or direction for a behavioral response that is implied, nonspecific, or stated in question form. This type of command implies that the child has a choice when often they do not.

Examples:

- Lets do your leg lifts now.
- Do you want to walk now?
- Lets transfer to the mat, OK?
- How about ten more?

Compliance - Compliance with instructions or commands. Child begins to comply following a direct command, or an indirect command within 5 seconds after it is given and completes the behavior without further prompting. Any negative behavior occurring while the child is complying does not affect compliance and should be ignored. Ex: PT says "Lift your leg up" and child says "NO!" but lifts leg anyway.

Noncompliance - Child does not begin to complete an instruction, or starts but fails to complete the command, direct or indirect, within ten seconds of the request. This includes delay tactics that interfere with therapy - behaviors that allow a delay in activity.

Examples:

- self-stimulating behaviors (rocking, touching self, etc.)
- engaging others in interaction, such as saying "hi" to people in the room/hall
- arguing with therapist, parents, or others
- distractibility, not paying attention,
- commenting/conversing about events or objects in environment
- making an excuse, or just saying "NO".
- any diversion from the task at hand that interferes with the child initiating the command within ten seconds and completing the command without further prompting.

No Opportunity for Compliance - After a command is given, the child is given 5 seconds to respond. No opportunity for compliance occurs when the child has not been given an adequate chance to comply.

Examples

- Commands that request a behavior to be performed in the not-immediate future (> 5 sec.).
 - *"You can ride the bike when we finish."
 - *Child dumps out all the bean bags and PT says "You have to put them away when you are done."
- When therapist completes the action requested in the therapists command, thus preventing the child from complying. Ex: PT says "Lift up your leg." And then picks up the child's leg for him/her.
- Verb phrases in a command that do not provide enough information for the child to perform the expected behavior.
 - "Look" "Listen"
 - "Be careful" can be replaced with a direct command "Put both crutches on the floor."
 - "Wait a minute." Can be replaced with a direct command "Stop at the door."

Praise - any specific or nonspecific verbalization that indicates liking, approval, or expresses a favorable judgment upon an activity, product, or attribute of the child.

Examples:

- You did a great job sitting up all by yourself! (labeled praise)
- I like how well you are walking today. (labeled praise)
- Thank you for transferring to the mat so quickly! (labeled praise)
- Good job. (unlabeled praise)
- Wow! (unlabeled praise)
- Way to go! (unlabeled praise)

Attention following appropriate child behavior - Talk or physical contact with the child contingent upon appropriate child behavior.

Examples:

- Child is ambulating well, and therapist talks to him/her.
- Child completes a set of exercises well, and therapists pats his/her arm and praises his/her efforts
- Child is whining, therapist ignores (see below), child stops crying, **and then** therapist provides attention after child stops crying.
- Child is tolerating stretching and is not whining, and therapist uses distraction by telling child a story.
- If the child is whining but complying, the therapist can continue to interact and praise the child for the positive behavior that is occurring.
Ex: PT says "Walk to the door." Child complies with the command, but whines, therapist can praise the compliance and ignore the whining.

Inappropriate Behavior - includes crying, whining, or yelling, and smart talk. Crying consists of inarticulate utterances of distress (audible weeping) at or below the loudness of normal conversation. Whining consists of words uttered by the child in a slurring, nasal, high-pitched, falsetto voice. Yelling consists of a loud screech, scream, shout or loud crying. The sound must be loud enough so that it is clearly above the intensity of normal indoor conversation. Smart talk consists of is impudent or disrespectful speech.

Examples:

Do I haaavvvveeee to?	NO! (very loud; yelling)
This is too hard.	STOP IT! (very loud; yelling)
I don't want to do this anymore.	Your stupid. (smart talk)
Why should I? (smart talk)	You can't make me! (smart talk)
I don't like you anymore! (smart talk)	Inappropriate grunting/noise
I'm gonna get you back (smart talk)	Stop or I'll hit you!

Aggression - any physical touch that is intended to be antagonistic, aversive, hurtful, or restrictive of the therapists activity or aggressive behavior directed at (2) self, or (3) environment.

Examples:

- Ripping up a book
- Breaking or throwing a toy
- hitting or attempting to hit someone or something (pounding fist in mat), swats at therapist or parent
- Refusing walker and kicking it over or grabbing the walker out of PT's hand.
- child pinches therapist
- child pushes therapists hand away

Pain behaviors - grimacing, vocalized complaints of pain, such as yelling out.

Examples:

"OWWWW!"
 "That hurts!!"
 "That's far enough!!!! That's far enough!!!!"

Attention following inappropriate child behavior - Talking to the child, looking at the child or providing physical touch, other than is therapeutically necessary, when the child is exhibiting inappropriate behavior, is noncompliant, or is being aggressive. This would include negotiating, such as offering a reward such as a desired toy, the presence of a parent, or an activity contingent on performance, “threatening” (a specific verbalization indicating a negative consequence will follow a behavior) the child, or allowing the child to escape from a demand situation, activity, or therapy.

Examples:

- Child is yelling, and therapist continues to talk and try to calm him/her.
- Child has stopped ambulating to ask a question, and therapist answers.
- Child is screaming inappropriately, and therapist is providing comfort.
- Child is being noncompliant and therapist says “If you walk to the door then we will stop.” (negotiating)
- Child is not standing appropriately and therapist says “You can play this game only if you stand up.” (negotiating)
- If you don’t stop crying mommy will have to leave. (threat)
- If you throw that toy you will never play with it again. (threat)
- Child starts whining during an exercise and therapist responds “When you stop whining, we will continue.”
- Child is noncompliant with therapists requests and is sent back to room. (escape)

Ignore inappropriate behavior. There is active ignoring and passive ignoring. During active ignoring, the therapist may take action by withdrawing physically from the child, restrain the child or remove an object from the child. During passive ignoring, the therapist does not provide any evidence of having heard or seen the inappropriate behavior that occurs, and works through the behavior. Often times, the child is allowed to escape from an activity by using aggression such as trying to prevent you from stretching by pushing your hands away. Always try to resume the activity, even if for a short duration, so that the child is not reinforced for aggression or other negative behavior.

Examples of Passive Ignoring:

- Child whines, and therapist does not react in any way, or acknowledge the child’s whining. Does not ask child to stop crying or ask what questions. Therapist continues with the exercise.
- Child acts out by purposefully not doing SLR’s correctly; therapist may not pay any attention to this, does not attempt to correct.
- Child throws toy; therapist does not scold or acknowledge that behavior happened; leaves the toy on the floor (passive).
- Child tries to prevent therapist from bending his/her knee further by pushing therapists hand away and PT continues to bend knee, not acknowledging/addressing child’s behavior. When child stops resisting for ~ 2 seconds, therapist can stop bending the knee. This way, the child is not reinforced by getting the PT to stop when he/she wants.

- Child stops walking and begins crying. Therapist can physically guide the child and push the walker forward briskly to complete the task. The crying is not an issue and is not addressed. When the task is completed, the therapist can still acknowledge completion:
 - PT - "Walk to the door."
 - child is walking to the door, and is almost there when he/she begins to cry and stops walking
 - PT briskly and firmly guides the child to the door with no emotion, comments, or extraneous physical touch.
 - Once at the door, PT can say "You walked to the door" Does not comment on crying.
- Child is complying with a command but is crying or screaming. PT ignores the crying and praises the child's compliance.
 - PT: "Do ten bridges."
 - child: "No!" but begins doing them
 - PT: "One, good job doing your bridges. Two..."

Examples of Active Ignoring:

- Child acts out by purposefully not doing SLR's correctly; PT physically holds the child's leg preventing the exercise, but does not address the child. Once child stops the negative behavior, physical therapist can provide a direct command such as "Tighten this muscle first, keep your knee straight and lift your leg. OR, therapist can firmly guide the child through the SLR's, but not address the child's behavior.
- Child acts like he/she will throw a toy, and therapist removes the toy from the child's hand and move it away, without speaking or other acknowledgment (active).

Information Descriptions - introduce information about people, objects, events, or activities, but do not clearly describe the child's current or immediately completed behavior.

Examples of Information Descriptions:

- "I can tell you have been doing your exercises".
- "Tomorrow is Saturday."
- "I'm going to work on your legs first."
- "Your legs feel tight today".
- "This is the last set".

Behavioral Descriptions - are statements used to describe the child and a verb describes the child's ongoing or immediately completed verbal or nonverbal observable behavior.

Examples of Behavioral Descriptions:

- "You're transferring to the mat."
- "I see you're trying hard to lift that leg."
- "You're pushing your wheelchair."

REFERENCES

- Allen, K. D., & Stokes, T. F. (1987). Use of escape and reward in the management of young children during dental treatment. Journal of Applied Behavior Analysis, 20, 381-390.
- Babbitt, R. L., Hoch, T. A., Coe, D. A., Cataldo, M. F., Kelly, K. J., Stackhouse, C., & Perman, J. A. (1994). Behavioral assessment and treatment of pediatric feeding disorders. Developmental and Behavioral Pediatrics, 15, 278-291.
- Baer, D. M., Wolf, M. M., & Risley, T. R. (1968). Some current dimensions of applied behavior analysis. Journal of Applied Behavior Analysis, 20, 313-328.
- Bandura, A. (1969). Principles of behavior modification. New York: Holt, Rinehart and Winston.
- Bandura, A. (1971). Psychotherapy based on modeling principles. In A. E. Bergin & S. L. Garfield (Eds.), Handbook of psychotherapy and behavior change (pp. 653-708). New York: Wiley.
- Bandura, A., & Kupers, C. J. (1964). Transmission of patterns of self-reinforcement through modeling. Journal of Abnormal and Social Psychology, 69, 1-9.
- Baron, R. A. (1970). Attraction toward the model and model's competence as determinants of adult imitative behavior. Journal of Personality and Social Psychology, 14, 345-351.
- Bernstein, G. S. (1982). Training behavior change agents: A conceptual review. Behavior Therapy, 13, 1-23.
- Bessmer, J. L. (1996). The dyadic parent-child interaction coding system II (DPICS-II): reliability and validity (Doctoral dissertation, University of Florida, 1996). Dissertation Abstracts International, 58-07B, p. 3961.
- Boggs, S. R., Danforth, J. S., & Stokes, T. (1986). Functional problem-solving skills: Increasing the generality of parent training. Paper presented at the meeting of the American Psychological Association, Washington, DC.

Bragg, J. H., Houser, C., & Schumaker, J. (1975). Behavior modification: Effects of reverse tailor sitting in children with cerebral palsy. Physical Therapy, 55, 860-868.

Branch, W. T. (1990). Teaching models in an ambulatory training program. Journal of General Internal Medicine, 5, S15-26.

Briener, J., & Beck, S. (1984). Parents as change agents in the management of their developmentally delayed children's noncompliant behaviors: A critical review. Applied Research in Mental Retardation, 5, 259-278.

Budd, K. S., Green, D. R., & Baer, D. M. (1976). An analysis of multiple misplaced parental social contingencies. Journal of Applied Behavior Analysis, 2, 459-470.

Carr, E. G. (1977). The motivation of self-injurious behavior: A review of some hypotheses. Psychological Bulletin, 84, 800-816.

Carr, E. G., & Durand, V. M. (1985). Reducing behavior problems through functional communication training. Journal of Applied Behavior Analysis, 18, 111-126.

Carr, E. G., Newsom, C. D., & Binkoff, J. A. (1980). Escape as a factor in the aggressive behavior of two retarded children. Journal of Applied Behavior Analysis, 13, 101-117.

Carroll, W. R., & Bandura, A. (1985). Role of timing of visual monitoring and motor rehearsal in observing learning of action patterns. Journal of Motor Behavior, 17, 269-281.

Chandler, L. S., & Adams, M. A. (1972). Multiply handicapped child motivated for ambulation through behavior modification. Physical Therapy, 52, 399-401.

Charlop, M. H., & Milstein, J. P. (1989). Teaching autistic children conversational speech using video modeling. Journal of Applied Behavior Analysis, 22, 275-285.

Cohen, J. (1960). A coefficient of agreement for nominal scales. Educational and Psychological Measurement, 20, 37-46.

Cunningham, C. E., Davis, J. R., Bremner, R., Dunn, K. W., & Rzasa, T. (1993). Coping modeling problem solving versus mastery modeling: effects on adherence, in-session process, and skill acquisition in a residential parent-training program. Journal of Consulting and Clinical Psychology, 61, 871-877.

Day, H. M., Horner, R. H., & O'Neill, E. O. (1994). Multiple functions of problem behaviors: Assessment and intervention. Journal of Applied Behavior Analysis, 27, 279-289.

Delamater, A. M., Conners, C. K., & Wells, K. C. (1984). A comparison of staff training procedures. Behavioral applications in the child psychiatric inpatient setting. Behavior Modification, 8, 39-58.

Dowrick, P. W. (1991). Practical guide to using video in the behavioral sciences. New York: Wiley Interscience.

Durand, V. M., & Carr, E. G. (1985). Self-injurious behavior: motivating conditions and guidelines for treatment. School Psychology Review, 14, 171-176.

Eisenstadt, T. H., Eyberg, S. M., McNeil, C. B., Newcomb, K., & Funderburk, B. (1993). Parent-child interaction therapy with behavior problem children: Relative effectiveness of two stages and overall treatment outcome. Journal of Clinical and Child Psychology, 22, 42-51.

Eyberg, S., Bessmer, J., Newcomb, K., Edwards, D., & Robinson, E. (1994). Dyadic Parent-Child Interaction Coding System-II: A Manual. Unpublished Manuscript, University of Florida, Gainesville, FL.

Eyberg, S. M., Boggs, S. R., & Algina, J. (1995). New developments in psychosocial, pharmacological, and combined treatments of conduct disorders in aggressive children. Psychopharmacology Bulletin, 31, 83-91.

Eyberg, S., Edwards, D., Bessmer, J., & Litwins, N. (1994). The workbook: A coder training manual for the Dyadic Parent-Child Interaction Coding System II. Unpublished manuscript, University of Florida, Gainesville, FL.

Eyberg, S. M., & Matarazzo, R. G. (1980). Training parents as therapists: a comparison between individual parent-child interaction training and parent group didactic training. Journal of Clinical Psychology, 36, 492-499.

Eyberg, S. M., & Robinson, E. A. (1982). Parent-child interaction training: Effects on family functioning. Journal of Clinical and Child Psychology, 11, 130-137.

Eyberg, S. M., & Robinson, E. A. (1983). Dyadic Parent-Child Interaction Coding System: A manual. Psychological Documents, 13, Ms. #2582.

Fabry, P. L., & Reid, D. H. (1978). Teaching foster grandparents to train severely handicapped persons. Journal of Applied Behavior Analysis, 11, 111-123.

Fordyce, W. E., Shelton, J. L., & Dundore, D. E. (1982). The modification of avoidance learning pain behaviors. Journal of Behavioral Medicine, 5, 450-414.

Forehand, R. L., & King, H. E. (1977). Noncompliant children: Effects of parent training on behavior and attitude change. Behavior Modification, 1, 93-108.

Foss, B. M. (1966). Operant conditioning in the control of movements. Developmental Medicine and Child Neurology, 8, 339-340.

Foster-Johnson, L., & Dunlap, G. (1993). Using functional assessment to develop effective, individualized interventions for challenging behaviors. Teaching Exceptional Children, 25, 44-50.

Frea, W. D., Koegel, L. K., & Koegel, R. L. (1994). Understanding why problem behaviors occur: A guide for assisting parents in assessing causes of behavior and designing treatment plans. Santa Barbara: University of California.

Fuller, P. R. (1949). Operant conditioning of a vegetative human organism. American Journal of Psychology, 62, 587-591.

Gardner, J. M. (1972). Teaching behavior modification to nonprofessionals. Journal of Applied Behavior Analysis, 5, 517-521.

Handen, B. L., Parrish, J. M., McClung, T. J., Kerwin, M. E., & Evans, L. (1992). Using guided compliance versus time out to promote child compliance: a preliminary comparative analysis in an analogue context. Research in Developmental Disabilities, 13, 157-170.

Harris, F. R., Johnston, M. K., Kelley, C. S., & Wolf, M. M. (1964). Effects of positive social reinforcement of regressed crawling of a nursery school child. Journal of Educational Psychology, 55, 35-41.

Hendrickson, J. M., Gardner, N., Kaiser, P. & Riley, A. (1993). Evaluation of a social interaction coaching program in an integrated day-care setting. Journal of Applied Behavior Analysis, 26, 213-225.

Hester, S. B. (1981). Effects of behavioral modification on the standing and walking deficiencies of a profoundly retarded child. Physical Therapy, 61, 907-911.

Hill, L. D. (1985). Contributions of behavior modification to cerebral palsy habilitation. Physical Therapy, 65, 341-345.

Horner, R. D., (1971). Establishing the use of crutches by a mentally retarded spina bifida child. Journal of Applied Behavior Analysis, 4, 183-189.

Hosford, R. E., & Johnson, M. E. (1983). A comparison of self-observation, self-modeling, and practice without video feedback for improving counselor interviewing behaviors. Counselor Education and Supervision, 23, 62-70.

Hudson, A. M. (1982). Training parents of developmental handicapped children: A component analysis. Behavior Therapy, 13, 325-333.

Isaacs, C. D., Embry, L. H., & Baer, D. M. (1982). Training family therapists: an experimental analysis. Journal of Applied Behavior Analysis, 15, 505-520.

Iwata, B. A., Pace, G. M., Dorsey, M. F., Zarcone, J. R., Vollmer, T. R., Smith, R. G., Rodgers, T. A., Lerman, D. C., Shore, B. A., Mazaleski, J. L., Goh, H., Cowdery, G. E., Kalsner, M. J., McCosh, K. C., & Willis, K. D. (1994). The functions of self-injurious behavior: An experimental-epidemiological analysis. Journal of Applied Behavior Analysis, 27, 215-240.

Kazdin, A. E. (1974). The effect of model identity and fear-relevant similarity on covert modeling. Behavior Therapy, 1, 427-452.

Kazdin, A. E. (1994). Behavior modification in applied settings. Belmont, CA: Brooks/Cole.

Kolderie, M. L. (1971). Behavior Modification in the treatment of children with cerebral palsy. PT, 51, 1083-1091.

Lalli, J. S., Mauk, J. E., Goh, H., & Merlino, J. (1994). Successful behavioral intervention to treat children who are reluctant to ambulate. Developmental Medicine and Child Neurology, 36, 625-629.

Mace, F. C., Page, T. J., Ivancic, M. T., & O'Brien, S. (1986). Analysis of environmental determinants of aggression and disruption in mentally retarded children. Applied Research in Mental Retardation, 7, 203-221.

Manella, K. J., & Varni, J. W. (1981). Behavioral therapy in a gait-training program for a child with myelomeningocele. Physical Therapy, 61, 1284-1287.

Martin, J. A. (1976). Behavior modification and cerebral palsy. Journal of Pediatric Psychology, 1, 48-50.

Matson, J. L., & Stephens, R. M. (1978). Increasing appropriate behavior of explosive chronic psychiatric patients with a social-skills training package. Behavior Modification, 2, 61-76.

McCullagh, P. (1986). Model status as a determinant of observational learning and performance. Journal of Sport Psychology, 8, 319-331.

McMahon, R. J., & Forehand, R. L. (1983). Consumer satisfaction in behavioral treatment of children: Types, issues, and recommendations. Behavior Therapy, 14, 209-225.

Meichenbaum, D. H. (1971). Examination of model characteristics in reducing avoidance behavior. Journal of Personality and Social Psychology, 17, 298-307.

Meyerson, L., Kerr, N., & Michael, J. L. (1967). Behavior modification in rehabilitation. In S. W. Bijou & D. M. Baer (Eds.), Child development: Readings in experimental analysis (pp. 214-239). New York: Meredith Publishing Company.

Miltenberger, R. G., & Veltum, L. G. (1988). Evaluation of an instructions and modeling procedure for training behavioral assessment interviewing. Journal of Behavioral and Experimental Psychiatry, 19, 31-41.

O'Dell, S. L. (1974). Training parents in behavior modification: a review. Psychological Bulletin, 81, 418-433.

O'Dell, S. L. (1985). Progress in parent training. In M. Hersen, R. M. Eisler, & P. M. Miller (Eds.), Progress in Behavior Modification (vol. 19, pp. 57-108). Academic Press.

Olmi, D. J., Sevier, R. C., & Nastasi, D. F. (1997). Time-in/time-out as a response to noncompliance and inappropriate behavior with children with disabilities: Two case studies. Psychology in the School, 34, 31-39.

Osnes, P. G. & Stokes, T. F. (1987, December). SCOOP: A direct observation instrument for the assessment of interactions. Presented at the Rivendell Conference for Clinical Practitioners, Memphis, Tennessee.

Parsonson, B. S., & Baer, D. M. (1986). The graphic analysis of data. In A. Poling, & R. W. Fuqua, (Eds.), Research methods in applied behavior analysis (157-186). New York: Plenum Press.

Parsonson, B. S., & Baer, D. M. (1992). The visual analysis of data, and current research into the stimuli controlling it. In T. R. Kratochwill, & J. R. Levin (Eds.), Single-case research design and analysis (pp. 15-40). Hillsdale, NJ: Lawrence Erlbaum Associates.

Pierce, C. H., & Garland, D. (1977). Effects of four training procedures on increasing motor skills of physically handicapped retarded persons. Journal of Mental Deficiency Research, 21, 25-35.

Rapport, M. D., & Bailey, J. S. (1985). Behavioral PT and spina bifida: a case study. Journal of Pediatric Psychology, 10, 87-97.

Repp, A. C., & Karsh, K. G. (1994). Hypothesis-based interventions for tantrum behaviors of persons with developmental disabilities in school settings. Journal of Behavior Analysis, 27, 21-31.

Reynell, J. K. (1965). Post-operative disturbances observed in children with cerebral palsy. Developmental Medicine and Child Neurology, 7, 360-376.

Rice, H. K., McDaniel, M. W., & Denney, S. L. (1962). Operant conditioning techniques for use in the physical rehabilitation of the multiply handicapped retarded patient. Physical Therapy, 48, 342-346.

Riley, A. W., Parrish, J. M., & Cataldo, M. F. (1989). Training parents to meet the needs of children with medical or physical handicaps. In C. E. Schafer, & J. M. Briesmeister, (Eds.): Handbook of parent training: Parents as co-therapists for children's behavior problems (pp. 305-336). New York: Wiley.

Singer, L. T., Nofer, J. A., Benson-Szekely, L. J., & Brooks, L. J. (1991). Behavioral assessment and management of food refusal in children with cystic fibrosis. Journal of Developmental and Behavioral Pediatrics, 12, 115-120.

Stokes, T. F., & Baer, D. M. (1977). An implicit technology of generalization. Journal of Applied Behavior Analysis, 10, 349-367.

Stokes, T. F., & Kennedy, S. H. (1980). Reducing child uncooperative behavior during dental treatment through modeling and reinforcement. Journal of Applied Behavior Analysis, 13, 41-49.

Stokes, T. & Mowery, D. (1999, May) OTIS observation system. Tampa: de la Parte Florida Mental Health Institute. (In revision).

Stokes, T., Mowery, D., Dean, K., & Hoffman, S. J. (1997). Nurturance traps of aggression, depression, and regression affecting childhood illness. In D. M. Baer & E. M. Pinkerston. (Eds.). Environmental approaches to social problems (pp. 147-154). Boulder, CO: Westview Press.

Stokes, T. F., & Osnes, P. G. (1988). The developing applied technology of generalization and maintenance. In R. H. Horner, & G. Dunlap (Eds.). (1988). Generalization and maintenance: Life-style changes in applied settings. (pp. 5-19). Baltimore, MD, USA: Paul H. Brookes Publishing.

Thelen, M. H., Fry, R. A., Fehrenbach, P. A., & Frautschi, N. M. (1979). Therapeutic videotape and film modeling: A review. Psychological Bulletin, 86, 701-720.

Trotter, A. B., & Inman, D. A. (1968). The use of positive reinforcement in PT. Physical Therapy, 48, 347-352.

Webster-Stratton, C. (1981). Videotape modeling: A method of parent education. Journal of Clinical Child Psychology, 10, 93-98.

Webster-Stratton, C. (1990). Enhancing the effectiveness of self-administered videotape parent training for families with conduct-problem children. Journal of Abnormal Child Psychology, 18, 479-492.

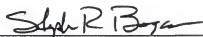
BIOGRAPHICAL SKETCH

Stacey J. Hoffman is the daughter of William R. Hoffman and Sandra S. Hoffman, Ph.D. She was born on November 6, 1965, in Elmhurst, Illinois. Stacey graduated from Paul D. Schreiber High School in January of 1983. She received a Bachelor of Science degree in physical therapy in 1987, at the Medical College of Georgia in Augusta, Georgia.

Stacey worked at Duke University Medical Center in Durham, North Carolina, for four years as a pediatric physical therapist. While in Durham, she discovered a passion for whitewater kayaking, and after a summer at the Nantahala Outdoor Center in Wesser, North Carolina, she moved there in 1991. She continued to paddle while working as a pediatric physical therapist at the Developmental Evaluation Center in Cullowhee, North Carolina, and began taking psychology courses.

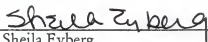
In 1993, Stacey began graduate studies in the Department of Clinical and Health Psychology at the University of Florida specializing in pediatric psychology. She completed her predoctoral internship at the Louis de la Parte Florida Mental Health Institute at the University of South Florida. As part of her internship, she conducted policy research in the area of mental health needs for children with special health care needs. Stacey currently resides in Melrose, Florida while working as a postdoctoral fellow in pediatric psychology at the University of Florida.

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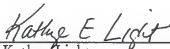
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This dissertation was submitted to the Graduate Faculty of the College of Health Professions and to the Graduate School and was accepted as partial fulfillment of the requirements for the degree of Doctor of Philosophy.

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